SAS® Forecast Analyst Workbench 5.3: Administrator's Guide, Second Edition

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Part 1

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Welcome to SAS Forecast Analyst Workbench

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What is SAS Forecast Analyst Workbench?

SAS Forecast Analyst Workbench is an analytical forecasting solution that uses actual values of key performance indicators (for example, demand) to generate predicted values. By forecasting the values of a KPI, you can perform downstream planning that can provide you with the following results:

- a reduction in stock orders of inventory
- a significant reduction in customer back orders
- a reduction in finished goods inventory
- consistently high levels of customer service, which results in high customer retention

SAS Forecast Analyst Workbench is an Adobe Flex client application. Users within your organization can access different parts of the solution based on the roles that are assigned to them. Users can view, review, interpret, and analyze the results of the forecasting and planning process.

Functional Components of SAS Forecast Analyst Workbench

SAS Forecast Analyst Workbench includes the following main functional components:

solution data mart
: the ongoing ETL jobs update the solution data mart with changes from the source system

analytics
: the analytical procedures that are required for forecasting processes

client applications
: the SAS Forecast Analyst Workbench web application available through a web browser

These components are seamlessly integrated to offer a true end-to-end solution. SAS Forecast Analyst Workbench can take data from several source systems and provide information for advanced business decisions.

Using SAS Forecast Analyst Workbench: Administrator's Guide

The *SAS Forecast Analyst Workbench: Administrator's Guide* provides you with the following information:

- installing and configuring SAS Forecast Analyst Workbench
- performing post-installation tasks
- running the ETL jobs by using SAS Data Integration Studio
- updating the configuration tables
- integrating SAS Forecast Analyst Workbench with other applications such as SAS Visual Analytics

You can use *SAS Forecast Analyst Workbench: Administrator's Guide* along with *SAS Forecast Analyst Workbench: Data Reference Guide* in order to start using SAS Forecast Analyst Workbench. You and your consulting team will use the *SAS Forecast Analyst Workbench: Data Reference Guide* to plan the structure of the database and the manner in which the data is stored, organized, and manipulated. This planning and data preparation must take place before you use the instructions to load data into your deployment. The *SAS Forecast Analyst Workbench: Data Reference Guide* contains details about the required tables that you must create in the Stage library before your data is loaded into SAS Forecast Analyst Workbench. The Stage library tables and their content are customized to meet the requirements of your deployment.

After SAS Forecast Analyst Workbench is installed and configured and data is loaded into the solution, forecast analysts and planners can start using the user interface of SAS Forecast Analyst Workbench. For more information about the tasks that can be performed in SAS Forecast Analyst Workbench, see *SAS Forecast Analyst Workbench: User's Guide*, embedded user assistance, and How-To topics.

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SAS Forecast Analyst Workbench Architecture

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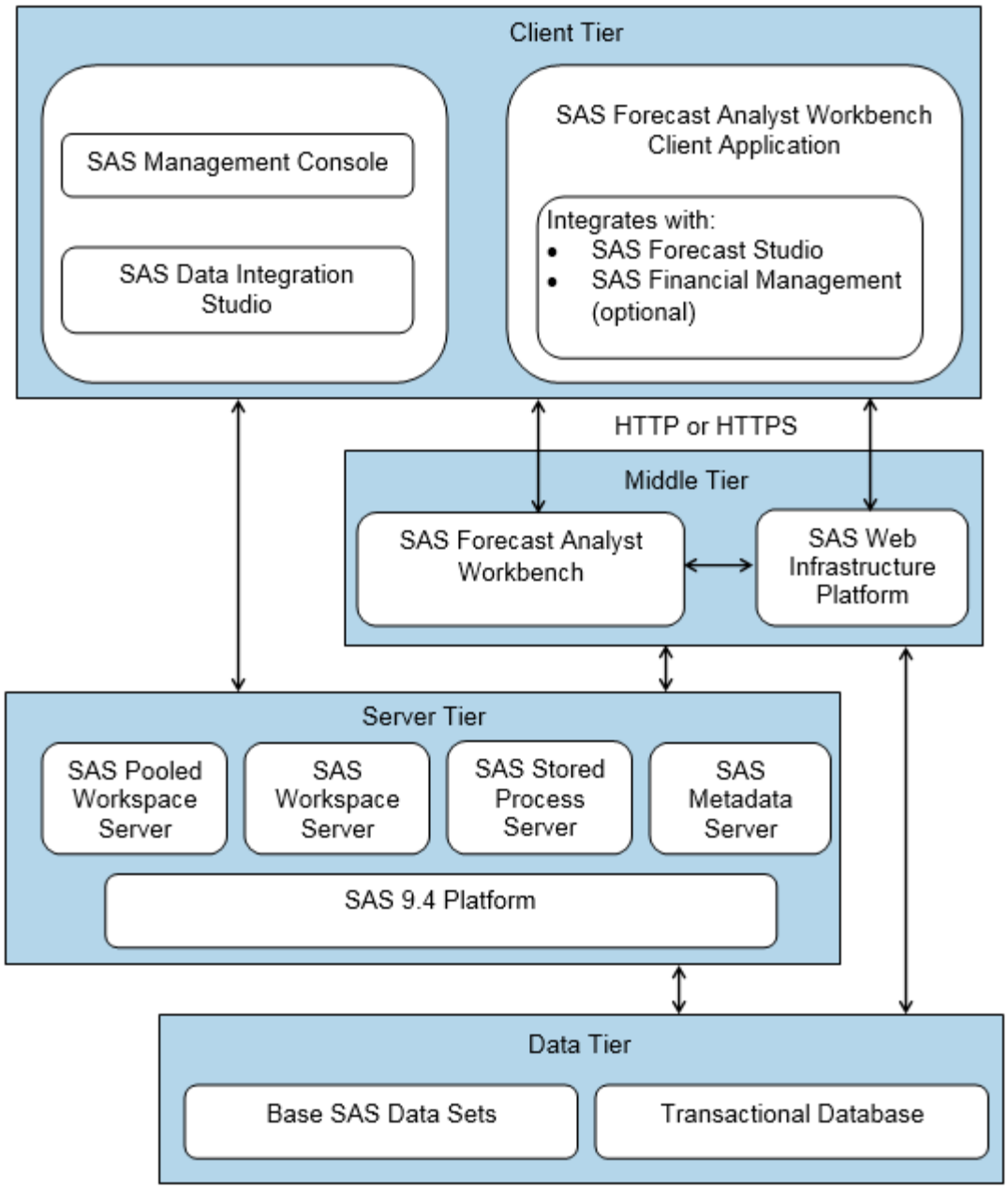
Overview of the Architecture of SAS Forecast Analyst Workbench

SAS Forecast Analyst Workbench uses an n-tier architecture that consists of the following tiers:

- client tier
- middle tier
- server tier
- data tier

The following figure shows the products and solutions that comprise each tier and how the tiers interact.

Figure 2.1 SAS Forecast Analyst Workbench Architecture



Client Tier

The client tier is responsible for user interaction, navigation flows, and displaying computational results. Using the client tier, users interact with the data, view the displayed computational results, and navigate to the process flows.

SAS Forecast Analyst Workbench requires the following applications:

- **SAS Management Console**: Enables you to perform metadata administration activities.

- **SAS Data Integration Studio**: Provides the ability to manage ETL jobs for the extraction, transformation, and loading of data.
- **SAS Forecast Studio**: Enables you to use more advanced forecasting capabilities of SAS Forecast Studio (for example, creating events and custom models). SAS Forecast Analyst Workbench integrates with SAS Forecast Studio. Users can open modeling projects in SAS Forecast Studio, and then promote the projects back to SAS Forecast Analyst Workbench after their analysis is complete.
- **SAS Financial Management**: Enables you to perform collaboration planning. Depending on your organization's license, SAS Financial Management is included in the software order.

Middle Tier

The middle tier is responsible for receiving the client request and for providing an execution environment to the client. The middle tier of SAS Forecast Analyst Workbench was developed over SAS Intelligence Platform middle-tier technologies such as SAS Web Infrastructure Platform and SAS Foundation Services. These services make it possible for the middle-tier application to run requests over to the SAS servers.

SAS Forecast Analyst Workbench requires the following middle-tier components:

- **SAS Forecast Analyst Workbench Services**: Takes adequate server-side actions based on client-side requests.
- **SAS Web Infrastructure Platform Services**: Used for standard operations, such as configuration, authentication, scheduler for batch processing, and so on.

The client tier communicates with the middle tier by using an HTTP-based or HTTPS-based communication model.

Server Tier

The server tier hosts various SAS servers that execute the requests made by the clients. Topological support might include support for non-functional requirements such as fail-over and pooling.

SAS Forecast Analyst Workbench requires the following server-tier components:

- **SAS Pooled Workspace Server**: Enables the middle tier to connect to SAS data sets in order to access the forecasted data.
- **SAS Workspace Server**: Executes SAS code for one client at a time.
- **SAS Stored Process Server**: Runs a registered stored process.
- **SAS Metadata Server**: Controls access to a central repository of metadata that is shared by all of the SAS applications in the deployment. The SAS Metadata Server enables centralized control so that all users access consistent and accurate data.

Data Tier

The data tier consists of the following data storage types:

- **Base SAS data sets**: Stored in Base SAS formats, using different libraries.
- **Transactional database**: Stores the transactional data that is used for forecasting. You use PostgreSQL as a transactional database for SAS Forecast Analyst Workbench.

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Application Management

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Performing Pre-installation Tasks

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Overview of Pre-installation Tasks

Before you install SAS Intelligence Platform and SAS Forecast Analyst Workbench, you must complete the following pre-installation tasks:

- verify the operating system requirements
- complete the pre-installation tasks that are required for installing SAS Intelligence Platform and SAS Forecast Analyst Workbench
- create a SAS Forecast Analyst Workbench user
- create a software depot
- obtain a deployment plan

Verifying System Requirements

Before you install SAS Forecast Analyst Workbench, ensure that you meet the minimum system requirements that are described in *System Requirements—SAS Forecast Analyst Workbench 5.3*. System requirements are unique for each operating system and contain items such as software requirements, hardware

requirements, space requirements, specific product requirements, and graphics hardware and software compatibility.

The detailed system requirements are available at http://support.sas.com/documentation/installcenter/en/ikforecstanofrndmsr/69170/HTML/default/index.html.

You should specifically check the following settings:

- Set the screen resolution for SAS Forecast Analyst Workbench no lower than 1024 x 768.
- Set your browser's pop-up blocker to allow pop-ups for your applications.

For more requirements information, see “SAS 9.4 System Requirements” at http://support.sas.com/resources/sysreq/index.html.

Completing the Pre-installation Tasks for the SAS Intelligence Platform

Before you install the SAS Intelligence Platform and SAS Forecast Analyst Workbench, read *SAS Intelligence Platform: Overview*. The overview is available at http://support.sas.com/documentation/cdl/en/biov/69018/HTML/default/viewer.htm. SAS Forecast Analyst Workbench is designed to work with the SAS Intelligence Platform. The overview will help you understand pre-installation tasks and will guide you through a typical installation.

The pre-installation tasks include installing third-party components, confirming that your operating system requirements are met, creating the required user accounts, and obtaining your SAS software. For more information, see *SAS Intelligence Platform: Installation and Configuration Guide*. This document is available at http://support.sas.com/documentation/onlinedoc/intellplatform/.

You must also use the Pre-Installation Checklist that accompanies the Deployment Plan that was prepared for the deployment of SAS Forecast Analyst Workbench at your site. Complete the work in the checklist before beginning the deployment at your site. The list includes tasks that are specific to your deployment, information about the third-party software required on each tier, the operating system accounts and groups, and port numbers needed on each machine before starting the deployment.

Creating a SAS Forecast Analyst Workbench User

You must create an operating system user account that will be used to run a series of ETL jobs during the setup of SAS Forecast Analyst Workbench. You can use an existing user account if one already exists. This user is different from the user account that installs and configures SAS Forecast Analyst Workbench and the SAS Spawned Servers account (sassrv). You can use the SAS Demo User account suggested in the Pre-Installation Checklist.

For more information about users and groups, see “Setting Up Users, Groups, and Ports” in the *SAS Intelligence Platform: Installation and Configuration Guide*.

The document is available at http://support.sas.com/documentation/cdl/en/biig/69172/HTML/default/viewer.htm.

SAS Software Order and SAS Software Depot

Your SAS Software Order E-Mail (SOE) provides you with information about how to download your SAS Software Depot. Follow those instructions to download your software and create a SAS Software Depot. An instructional video for SAS 9.4 Software Depots is available at

http://support.sas.com/documentation/installcenter/gettingstarted/94/index.html.

Obtaining a Deployment Plan

Before you can install SAS Forecast Analyst Workbench, you must obtain a deployment plan. The deployment plan is a summary of the software that you install and configure during the deployment. The deployment plan file, named plan.xml, contains information about what software you should install and configure on each machine in your environment. This plan serves as input to the SAS installation and configuration tools. You should use the deployment plan that is created for your site. The deployment plan is accompanied by the pre-installation checklist. For more information, see “About Deployment Plans” in the *SAS Intelligence Platform: Installation and Configuration Guide*. The guide is available at http://support.sas.com/documentation/onlinedoc/intellplatform/.

When the application context of SAS Forecast Analyst Workbench is on a different machine, select the **Data Step Batch Server** option for SAS Forecast Analyst Workbench SASApp tier when you create a plan file.

Confirming the Deployment for SAS Visual Analytics Administration and Reporting

SAS Visual Analytics Administration and Reporting is included in your order. Determine whether your deployment includes distributed or non-distributed SAS LASR Analytic Server, and then complete the appropriate additional pre-installation tasks. For more information, see the Solution-Specific System Requirements and Installation Instructions section of the Pre-Installation Checklist.

Determining the Location of the SAS Environment URL

During the deployment process, the SAS Deployment Wizard prompts you to specify the URL of the SAS environment file, which is named sas-environment.xml (for example, http://<*SAS Web Server host*:port>/sas/sas-environment.xml). This file defines a set of SAS deployments that the client applications at your site will use.

The sas-environment.xml file does not need to physically exist at the URL location that you specify in the SAS Deployment Wizard before you begin the SAS installation. However, it is important for you to know the value of this URL because every client installation is prompted for this value. If you do not specify the URL when you install SAS Forecast Analyst Workbench, then you must manually edit a file on every client machine as a post-installation task. Therefore, you should decide on a value for this URL during your planning process so that you can provide it to administrators who might perform an installation.

For more information about the structure of this file, see “Configuring the SAS Environment File” in the *SAS Intelligence Platform: Middle-Tier Administration Guide*. This guide is available at http://support.sas.com/documentation/onlinedoc/intellplatform/.

Preparing a Bridge From SAS Forecast Analyst Workbench to SAS Viya

If you have access to SAS Viya, you might want to prepare a bridge from SAS Forecast Analyst Workbench to SAS Viya using SAS/CONNECT in order to perform custom analyses.

In SAS Deployment Wizard, you can provide information about the SAS Viya deployment that will be used to establish the bridge. You must have the following information ready before you install and configure SAS Forecast Analyst Workbench:

- SAS Viya host name
- port number of the SAS/CONNECT spawner that is present on SAS Viya
- credentials for accessing SAS Viya

About Migration

You can migrate from SAS Forecast Analyst Workbench 5.1 and SAS Forecast Analyst Workbench 5.2 to SAS Forecast Analyst Workbench 5.3. For more information about migration, see *SAS Forecast Analyst Workbench: Migration Guide* located at http://support.sas.com/documentation/solutions/faw/index.html

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Select a Single-Tier or Multi-Tier Installation

You can install SAS Forecast Analyst Workbench on one or on several machines. This choice is determined when you order SAS Forecast Analyst Workbench and is detailed in the deployment plan. You must first install SAS Forecast Analyst Workbench on the server tier, which can consist of multiple machines. You can then install SAS Forecast Analyst Workbench on your middle tier, which can also consist of multiple machines. For guidelines on installing SAS on multiple machines, see “Installation Order Rules for Multiple Machine Deployments” in *SAS Intelligence Platform: Installation and Configuration Guide*.

The server tier consists of a set of SAS servers that you install as a part of the SAS Intelligence Platform. These servers host (and can be used to load) the reporting data. In addition, they execute SAS analytical and reporting processes. The SAS Workspace Server, SAS Stored Process Server, and SAS Metadata Server enable this capability.

The middle tier hosts SAS web applications, including the SAS Forecast Analyst Workbench web application. These web applications are deployed on a Java web application server. The web application sends data to and receives data from the web browsers on the client machines. It then organizes the data for storage on the data tier and for use on the server tier.

The client tier is also part of the SAS Forecast Analyst Workbench configuration. On the client tier, users collect and load data and perform day-to-day operational tasks via the web application.

Deploy SAS Collaborative Planning Workbench

If you have purchased a license for SAS Collaborative Planning Workbench, you must deploy the middle tier of SAS Financial Management and SAS Forecast Analyst Workbench on the same server. Similarly, install the server tier of SAS Financial Management and SAS Forecast Analyst Workbench on the same server.

Deploy SAS Forecast Analyst Workbench on a Grid

You might want to use SAS Grid Manager to distribute SAS computing tasks among multiple computers on a network. You can deploy SAS Forecast Analyst Workbench on the grid.

For more information about using SAS Grid Manager and to understand the deployment on a grid, see *Grid Computing in SAS 9.4* at http://support.sas.com/documentation/cdl/en/gridref/69583/HTML/default/viewer.htm.

SAS Deployment Wizard Tasks

You use the SAS Deployment Wizard to install and configure the SAS software, the PostgreSQL database, and related products that are included in your deployment plan. When you execute the SAS Deployment Wizard, you select the deployment type that you are performing. You can choose to install and configure the software immediately, or you can configure the software at a later time.

Depending on your SAS software order, the SAS installation data file, and the deployment plan, the SAS Deployment Wizard prompts you to perform a variety of tasks, including the following items:

- specify the location of the deployment plan and the SAS software products that you are installing and configuring
- specify the email address to which SAS Forecast Analyst Workbench should send emails when an ad hoc scenario has completed running in the background
- specify required machine information
- specify server information for any SAS servers that you are installing
- specify user account information

Note: Specify the spawned server user to access and perform tasks related to stored processes.

- select the **Grant access to SAS Forecast Studio tasks** check box and create an environment for SAS Forecast Server
- specify a SAS internal account for the forecast server metadata user
- specify the credentials for using the PostgreSQL database
- specify the credentials for deploying SAS Financial Management

  This item is required only when SAS Financial Management is a part of the deployment plan.
- (Optional) Select the settings to set up a bridge from SAS Forecast Analyst Workbench to SAS Viya using SAS/CONNECT to perform custom analysis. If you choose to set up this bridge, you must specify the SAS Viya host name, the SAS Viya SAS/CONNECT Spawner port, and the credentials.

  If you choose not to set up the bridge while deploying SAS Forecast Analyst Workbench, you can set it up later. For more information about setting up the bridge later, see “Setting Up the Bridge After Deployment” on page 45.
- specify whether you want to assign SAS users permissions on UNIX system

Note: Do not include spaces in the directory name.

For more information, see “Preparing to Install and to Configure” in *SAS Intelligence Platform: Installation and Configuration Guide*. This document is available at http://support.sas.com/documentation/onlinedoc/intellplatform/index.html.

Review the Instructions.html Document

After you have installed and configured your SAS software, the SAS Deployment Wizard writes the Instructions.html document to the `Documents` directory in your SAS configuration directory. The document contains additional information and details for configuring your installation. You should perform the additional steps that are included in the document.

When you are performing additional steps that are mentioned in the instructions.html, you might see the following warnings in the logs for the server that you are validating when you perform the Server Validation Steps provided in the Instructions.html on the SAS tier:

```
WARNING: User does not have appropriate authorization to access
Software component SAS Forecast Analyst Config
WARNING: Apparent symbolic reference GL_SHORT_YES not resolved.
WARNING: iotrans Libraray reference not found
```

To prevent these warnings, ensure that you run the script as the SAS Demo User. You can set up the SAS Demo User while you are running the SAS Deployment Wizard.

Install Hot Fixes for the Fourth Maintenance Release of SAS 9.4 and SAS Forecast Analyst Workbench

Ensure that you install all hot fixes for the fourth maintenance release of SAS 9.4 and for SAS Forecast Analyst Workbench 5.3. Installing all required hot fixes ensures that SAS Forecast Analyst Workbench functions correctly. Use the following list to search for the correct hot fix for the fourth maintenance release of SAS 9.4 and for SAS Forecast Analyst Workbench:

- SAS Forecast Analyst Workbench hot fixes and associated hot fixes for the fourth maintenance release of SAS 9.4 are available at http://ftp.sas.com/techsup/download/hotfix/hotfix.html.
- Use the tool at http://ftp.sas.com/techsup/download/hotfix/HF2/SASHFADD.html to create a customized report that lists hot fixes that are available for the installed SAS products and generate scripts that automate the download of the hot fixes.
- You install all SAS 9.4 hot fixes with the SAS Deployment Manager. For more information about applying hot fixes, see the section about SAS Deployment Manager tasks in *SAS Deployment Wizard and SAS Deployment Manager 9.4: User's Guide*.

To receive email notifications about new hot fixes:

1. Navigate to http://ftp.sas.com/techsup/download/hotfix/hotfix.html.
2. Select **Subscribe to TSNEWS-L**, and follow the prompts to subscribe to the TSNEWS-L listserv.

Default File Locations

The SAS Deployment Wizard installs and configures your SAS software. The application installation files are installed in a default location referred to as **`<SAS Home>`**. For example, on Windows systems, **`<SAS Home>`** is **`C:/Program Files/SASHome`**.

The configuration files are stored in a default location referred to as ***`SAS-configuration-directory`***. For example, on Windows systems, the SAS configuration directory is **`C:/SAS/Config/Lev1`**.

Note: You can deploy up to 10 configurations of the SAS products. For example, you can create an environment that consists of separate levels for development, test, and production. The SAS Deployment Wizard specifies each configuration in a **`<Level>`** folder. For example, if you deploy a level 2 configuration, the default configuration directory is **`C:/SAS/Config/Lev2`**. For more information about multiple-level configuration, see *SAS Intelligence Platform: System Administration Guide*.

The following table lists the default locations of the installation and configuration files for SAS Forecast Analyst Workbench.

Table 4.1 Default Locations

Location	Example Path on Windows Systems	Example Path on UNIX Systems
SAS-configuration-directory	C:\SAS\Config\Lev<*n*>	../SAS/Config/Lev<*n*>
SASHome	C:\Program Files \SASHome	../SASHome

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Set the Secure Attribute for Session Cookies

The secure attribute for cookies directs a web browser to send the cookie only through an encrypted HTTPS connection.

To configure the SAS Web Application Server to return the session ID with the secure attribute:

1. Edit the ***SAS-configuration-directory*\Levn\Web\WebAppServer\SASServern_m\conf\server.xml** file. Add **secure="true"** to the existing `Connector` element.
2. Edit the ***SAS-configuration-directory*\Levn\Web\WebAppServer\SASServern_m\conf\web.xml** file. Add the following `session-config`:

```
<session-config>
                    <session-timeout>30</session-timeout>
                    <cookie-config>
                        <secure>/true</secure>
                    </cookie-config>
                </session-config>
```

For more information, see “Configuring SAS Web Server Manually for HTTPS” at http://support.sas.com/documentation/cdl/en/bimtag/68217/HTML/default/viewer.htm#n0nakjyj6hlqmvn11p9p04l25j9n.htm.

Update PostgreSQL Configuration

Immediately after you deploy SAS Forecast Analyst Workbench, update the PostgreSQL database configuration.

To configure PostgreSQL:

1. Open the postgresql.conf file that is located at the following location on the server-tier machine: ***SAS-configuration-directory*\Levn\WebInfrastructurePlatformDataServer\data**
2. Change the value of shared_buffers to **4GB** and the value of max_connections to **500**.
3. Save the file.

4 Restart the data servers.

Verify SASApp Server Context

Immediately after you deploy SAS Forecast Analyst Workbench, verify the context of SASApp servers.

To verify the context of SASApp servers:

1 Log on to SAS Management Console as an unrestricted user (sasadm) or as a user who has the capability to verify the SASApp server context.

2 On the **Plug-ins** tab, select **Application Management** ▸ **Configuration Management** ▸ **SAS Application Infrastructure** ▸ **Web Infra Platform Services 9.4** ▸ **JobExecutionService**.

3 Right-click **JobExecutionService** and select **Properties**. The JobExecutionService Properties dialog box appears.

4 On the **Settings** tab, verify that all SASApp server contexts are selected.

5 Click **OK**.

Updating Permissions Granted to Users

Assigning Permissions to Users

Assign Permissions to the SAS Server Users Group on Windows Systems

You must assign the SAS Server Users group Read, Write, and Modify permissions for the following folders on a Windows SAS Application Server machine:

- the SAS Forecast Analyst Workbench data folder located at ***SAS-configuration-directory*/AppData/SASForecastAnalystWorkbench**
- the SAS Forecast Analyst Workbench archive folder located at ***SAS-configuration-directory*/AppData/SASForecastAnalystWorkbench**
- the following folders inside the path ***SAS-configuration-directory*/Levn/SASApp/Data/**:
  - **/FinancialManagement**

    Note: If you are not using collaboration planning, you do not need to provide permission for this folder.
  - **/FinancialManagement/StageFM**

    Note: If you are not using collaboration planning, you do not need to provide permission for this folder.

  - **/WRSDIST**
  - **/WRSTEMP**
- the forecasting-related logs stored in the path that is specified in the GL_FORECAST_LOG_PATH parameter

  For more information about configuration parameters, see "About the Configuration Parameters" on page 35.
- the path for the generic logs for SAS Forecast Analyst Workbench that is specified in the GL_DDCF_LOG_PATH parameter if the GL_DDCF_LOG_CREATION_FLAG parameter is set to **Yes**

For more information about defining groups, go to http://support.sas.com/documentation/cdl/en/biig/69172/HTML/default/viewer.htm#n02014intelplatform00install.htm.

Assign SAS Users Permissions on UNIX Systems

In a UNIX operating system environment, several SAS script files must contain a umask setting to ensure that SAS users have the necessary Write permissions to the tables that the SAS Workspace Server and the SAS Stored Process Server create.

If you allowed the SAS Deployment Wizard to assign SAS users permissions on UNIX system for you, verify that there is a umask setting of at least **002** in the following SAS script files. If you did not allow the SAS Deployment Wizard to make these settings for you, you must specify a umask setting of at least **002** in these files.

- ***SAS-configuration-directory*/Levn/SASApp/BatchServer/sasbatch_usermods.sh**
- ***SAS-configuration-directory*/Levn/SASApp/PooledWorkspaceServer/PooledWorkspaceServer_usermods.sh**
- ***SAS-configuration-directory*/Levn/SASApp/StoredProcessServer/StoredProcessServer_usermods.sh**
- ***SAS-configuration-directory*/Levn/SASApp/WorkspaceServer/WorkspaceServer_usermods.sh**

The following code is a code snippet of the SAS script file

```
USERMODS_OPTIONS=
umask 002
```

After you update these files with the umask setting, you must restart the object spawner.

Defining Groups, Roles, and Users

Overview of Groups, Roles, and Users

In order to use SAS Forecast Analyst Workbench, you must configure groups, roles, and users.

groups
: A group consists of users who are classified by common traits or by common data access levels. Groups are typically used for granting users access to

data. Groups can also be used within workflows to allow a restricted set of users to perform an activity.

roles
: Roles determine what a user can do within the application. Roles can be assigned to groups to allow a restricted set of users within that group to perform an activity.

users
: Every user who needs to log on to the SAS Forecast Analyst Workbench web application must be defined in the SAS Metadata Repository. The user must be associated with one or more roles that permit one or more capabilities within SAS Forecast Analyst Workbench.

You define groups, roles, and users by using the User Manager function in SAS Management Console.

Note: For specific information about defining users, groups, and roles, see *SAS Management Console: Guide to Users and Permissions*.

Capabilities can be associated with roles in SAS Management Console.

Understanding Roles

Roles in SAS Forecast Analyst Workbench are activity based. You assign roles to groups, and those role assignments are cumulative. For example, if a group is assigned to more than one role, that group does not lose any capabilities if the capabilities of the roles are different. For example, suppose a group is associated with Role 1 and Role 2. If Role 1 grants a group a specific capability but Role 2 does not, the group retains that capability granted by Role 1.

After you deploy SAS Forecast Analyst Workbench, ensure that the following roles have been created in SAS Management Console:

- Forecast Analyst: Analysis
- Forecast Analyst: Planning
- Forecast Analyst: Process Administration

In addition to the roles that are created after you deploy SAS Forecast Analyst Workbench, you can create roles that are based on your business requirements. For more information about creating roles, see *SAS Management Console: Guide to Users and Permissions*.

Understanding Groups

A group in SAS Forecast Analyst Workbench is based on the area of work associated with the users in that particular group. You can add users to the groups based on their area of work. For example, a database administrator can be a member of the database users group. You can add a user to multiple groups. Every group can be assigned one or more roles, and the capabilities of those roles are inherited by the group.

After you deploy SAS Forecast Analyst Workbench, ensure that the following groups are created in SAS Management Console:

- Forecast Analyst Analysis Users
- Forecast Analyst Database Users
- Forecast Analyst ETL Users

- Forecast Analyst Planning Users
- Forecast Analyst Process Administration Users

Associate the Forecast Analyst Planning Users group with the user who creates the forecasts and performs planning-related tasks. The Forecast Analyst Planning Users group contains the following groups and roles:

- Financial Management: Process Administrator
- Forecast Analyst: Planning
- Forecast Analyst Database Users
- SASSDM Database Users
- Visual Data Builder Administrators

Associate the Forecast Analyst Analysis Users group with the users who perform model management-related tasks. The Forecast Analyst Analysis Users group contains the following groups and roles:

- Forecast Analyst: Analysis
- Forecast Analyst Database Users
- Forecast Server: Administrator
- Forecast Server: Analyst
- Forecast Server: Browser
- Forecast Server: Forecaster
- Job Execution: Job Submitter
- Visual Analytics Data Administrators
- Visual Data Builder Administrators

Associate Forecast Analyst ETL Users group with the user who runs the ETL jobs. The Forecast Analyst ETL Users group contains the following groups and roles:

- Financial Management: Process Administrator
- Forecast Analyst Database Users
- SASSDM Database Users
- Visual Analytics Data Administrators
- Visual Data Builder Administrators

Associate the Forecast Analyst Process Administration Users group with the user who administers SAS Forecast Analyst Workbench. The Forecast Analyst Process Administration Users group contains the following groups and roles:

- Forecast Analyst Database Users
- Forecast Analyst: Process Administration
- Financial Management: Process Administrator
- Forecast Server: Administrator
- Forecast Server: Analyst
- Forecast Server: Browser
- Forecast Server: Forecaster

- Job Execution: Job Submitter
- SASSDM Database Users
- Visual Analytics Data Administrators
- Visual Data Builder Administrators

Note: The groups and roles that are related to SAS Financial Management are available only when SAS Financial Management is deployed along with SAS Forecast Analyst Workbench.

In addition to the groups that are created after you deploy SAS Forecast Analyst Workbench, you can create groups that are based on your business requirements. For more information about adding a group, see *SAS Management Console: Guide to Users and Permissions*.

Defining Users

You can create users who can access SAS Forecast Analyst Workbench. When you define users who can access SAS Forecast Analyst Workbench, you must conform to the following guidelines:

- on Windows, the user must be a member of your operating system user group SAS Server Users
- on UNIX, the user must be a member of the group that the installation user belongs to
- the user must be defined in SAS Management Console
- after you add the user, you must assign the user to the appropriate groups

For more information about creating users and assigning groups and roles to them, see *SAS Management Console: Guide to Users and Permissions*.

Authorize a User to Access SAS Visual Analytics

When SAS Forecast Analyst Workbench and SAS Visual Analytics are installed on two separate servers, you must provide authorization to the user who accesses SAS Visual Analytics. For example, suppose SAS Forecast Analyst Workbench is installed on an AIX server and SAS Visual Analytics is installed on a LAX server. In such a scenario, you must authorize the user to access SAS Visual Analytics. This authentication domain is in addition to the default authentication domain.

To authorize a user to access SAS Visual Analytics:

1. Log on to SAS Management Console as an administrative user (sasadm) or as a user with administrative rights.
2. On the **Plug-ins** tab, select **SAS Management Console** ▸ **Environment Management** ▸ **User Manager**.
3. Right-click on one of the SAS Forecast Analyst Workbench users, and select **Properties**. The Properties dialog box appears.

4 On the **Accounts** tab, click **New**. The New Login Properties dialog box appears.

5 Enter all appropriate information. In the **Authentication Domain** field, enter the authentication domain that was created while deploying SAS Forecast Analyst Workbench and SAS Visual Analytics.

6 Click **OK** to close the **New Login Properties** dialog box, and click **OK** again.

Roles and Capabilities in SAS Forecast Analyst Workbench

Roles in SAS Forecast Analyst Workbench

SAS Forecast Analyst Workbench contains the following roles that you can assign to a user or to a group:

Forecast Analyst: Analysis	enables you to perform all statistical analysis-related tasks, such as editing parameters, diagnosing a forecast, integrating a forecast with SAS Forecast Studio, and so on. This role also enables you to generate forecasted values for new products.
Forecast Analyst: Planning	enables you to perform all planning-related activities, such as managing plans and performing collaboration planning, managing product life cycles, and so on.
Forecast Analyst: Process Administration	enables you to perform all tasks within SAS Forecast Analyst Workbench, including the tasks that users with the role of a planner and an analyst can perform.

View and Assign Capabilities

Capabilities in SAS Forecast Analyst Workbench are arranged in the following categories: planning, modeling, collaboration, administrative, and other. Depending on the role of the user in your organization, you can assign the role with the required capabilities to that user. For example, if a user is a planner in your organization, you can assign a planning-related role to that user. You can also assign a role with planning capabilities to a group so that all users in that group share the same capabilities.

To view the capabilities included in a role:

1 Log on to SAS Management Console as an administrative user (sasadm) or as a user who has the capability to view roles.

2 On the **Plug-ins** tab, select **SAS Management Console** ▸ **Environment Management** ▸ **User Manager**.

3 Right-click on one of the SAS Forecast Analyst Workbench roles, and select **Properties**. The Properties dialog box appears.

4 Click the **Capabilities** tab.

5 On the **Capabilities** tab, expand **Forecast Analyst Mid-Tier**. The planning, modeling, collaboration, administrative, and other capabilities appear. Select the capabilities for the role according to your business requirements.

Planning Capabilities

Planning capabilities enable a user to perform the organizational planning activities in SAS Forecast Analyst Workbench. A user can create, edit, delete, and copy a forecast plan. The following table describes the planning capabilities.

Table 5.1 Planning Capabilities

Capability	Description	User Interface Impact
Create Forecast	Enables a user to create a forecast and to specify the scope of the forecasting activity.	The button is visible in the Forecasts category of the Forecast Plans workspace.
Edit Forecast	Enables a user to modify the forecast.	The button is visible in the Forecasts category of the Forecast Plans workspace.
Delete Forecast	Enables a user to delete a forecast.	The button is visible in the Forecasts category of the Forecast Plans workspace.
Copy Forecast	Enables a user to copy the forecast.	The button is visible in the Forecasts category of the Forecast Plans workspace.

Modeling Capabilities

Modeling capabilities enable a user to generate forecast values and to perform tasks related to model management. The following table describes the modeling capabilities.

Table 5.2 Modeling Capabilities

Capability	Description	User Interface Impact
Edit Parameters	Enables a user to edit parameters for the entire forecast, for a time series, or for multiple selected time series.	The button, and the **Edit parameters for forecast** and **Edit parameters of the time series** links are visible in the Model Management view.
Diagnose Forecast	Enables a user to diagnose a forecast and generate the predicted values.	The is visible on the toolbar of the Forecasts category . The **Diagnose** or **Re-Diagnose** button is visible in the Model Management view.

Capability	Description	User Interface Impact
Accept Forecast	Enables a user to accept the forecast when the predicted values are satisfactory.	The **Accept** button is visible in the Model Management view.
Forecast Studio Integration	Enables a user to analyze a forecast in SAS Forecast Studio.	The button is visible in the Model Management view and in the Modeling category.
Re-Run Forecast	Enables a user to rerun a forecast for a time series or for the selected forecast-leaf-level time series.	The button is visible in the Model Management view.
Reconcile	Enables a user to reconcile the predicted values of a forecast.	The **Reconcile** button is visible in the Model Management view.
Scenario Analysis	Enables a user to perform scenario analysis by using the forecasted values.	The **Scenario** tab is enabled in the Model Management view if the forecast model included independent variables.

Collaboration Capabilities

Collaboration capabilities enable a user to perform the tasks that are related to collaboration planning. The following table describes the collaboration capabilities.

Table 5.3 *Collaboration Capabilities*

Capability	Description	User Interface Impact
Create Plan	Enables a user to create a plan for performing collaboration planning.	The button is visible in the Collaboration category.
Delete Plan	Enables a user to delete a plan.	The button is visible in the Collaboration category.
Open Collaboration Flow	Enables a user to open the Collaboration Flow view in the Collaboration category.	The button is visible in the Collaboration category.
Open Explore Demand	Enables a user to open the Explore Demand view and analyze the demand of a plan.	After a user double-clicks a plan, the Explore Demand view is available in the Collaboration category.
Refresh Plan Data	Enables a user to refresh a plan in order to obtain the latest incremental data.	The button is visible in the Collaboration category.
Collaboration	Enables a user to perform collaboration planning by using the forecasted values.	The Collaboration category is visible in the Forecast Plans workspace.

Capability	Description	User Interface Impact
Edit Plan	Enables a user to edit the plan in order to modify its parameters.	The button is visible in the Collaboration category.

Other Capabilities

Other capabilities enable a user to perform tasks within SAS Forecast Analyst Workbench that are related to analyzing the forecast values. The following table describes the other capabilities.

Table 5.4 *Other Capabilities*

Capability	Description	User Interface Impact
New Product Forecasting, Create Project	Enables a user to create a forecast project for a new product and to forecast the future values for that new product.	The and buttons are visible in the New Products workspace.
New Product Forecasting, Assign Project to Forecast	Enables a user to assign the new product forecast project to a forecast.	The button is visible in the New Products workspace.
View Comments Manager	Enables a user to view and add comments about a forecast.	The **Comments Manager** pane is visible in the Forecasts category, the Modeling category, and the Collaboration category of the Forecast Plans workspace.
Edit Batch Run Details	Enables a user to schedule a forecast to run periodically in batch mode.	The fields and options in the **Batch Run Details** pane are enabled in the Forecasts category of the Forecast Plans workspace.
View Analysis Workspace	Enables a user to view the Analysis workspace and to perform tasks related to custom analysis.	The Analysis workspace is visible.
View Reports Workspace	Enables a user to open a report in SAS Visual Analytics or SAS Web Report Studio from the Reports workspace.	The Reports workspace is visible.
View Administration Workspace	Enables a user to view the Administration workspace and perform tasks related to product life cycle management.	The Administration workspace is visible.

Administrative Capabilities

Administrative capabilities enable a user to manage the life cycles of products. The following table describes the administrative capabilities.

Table 5.5 *Administrative Capabilities*

Capability	Description	User Interface Impact
Manage All Forecasts, Plans, and Projects	Enables a user to create, edit, and delete all forecasts, plans, new product forecast projects, and modeling projects. The user can view and manage the forecasts, plans, and projects that are created by other users. Use this capability for performing administrative tasks (such as deleting a forecast when its owner is not available). **Note:** Do not use the capability to work on a forecast, plan, or project regularly because you might be working on it simultaneously with the owner. Concurrently working on an object might result in errors or in data corruption.	Entire user interface of SAS Forecast Analyst Workbench.
Search Products for Product Lifecycle	Enables a user to search for a product across multiple products in Administration workspace.	The **Search** and **Advanced Search** dialog boxes are visible in the Administration workspace.
Edit Product Lifecycle for Single Product	Enables a user to edit the life cycle of a product.	After a user double-clicks a product, the Product Life Cycle view is visible in the Administration workspace.
Edit Product Lifecycle for Multiple Products	Enables a user to manage the life cycles of multiple products simultaneously.	The Product Life Cycle view is visible in the Administration workspace.

Roles and Their Default Capabilities

The following table displays the roles and their default capabilities.

Table 5.6 *Mapping of Roles and Capabilities*

Capabilities	Roles		
	Forecast Analyst: Process Administration	**Forecast Analyst: Planning**	**Forecast Analyst: Analysis**
Planning Capabilities			
Create Forecast	Yes	No	Yes
Edit Forecast	Yes	No	Yes
Delete Forecast	Yes	No	Yes
Copy Forecast	Yes	No	Yes
Modeling Capabilities			
Edit Parameters	Yes	No	Yes
Diagnose Forecast	Yes	No	Yes
Accept Forecast	Yes	No	Yes
Forecast Studio Integration	Yes	No	Yes
Re-Run Forecast	Yes	No	Yes
Reconcile	Yes	No	Yes
Scenario Analysis	Yes	Yes	Yes
Collaboration Capabilities			
Create Plan	Yes	Yes	No
Delete Plan	Yes	Yes	No
Open Collaboration Flow	Yes	Yes	No
Open Explore Demand	Yes	Yes	Yes
Refresh Plan Data	Yes	Yes	No
Collaboration	Yes	Yes	Yes
Edit Plan	Yes	Yes	No
Other Capabilities			
New Product Forecasting, Create Project	Yes	Yes	Yes

Capabilities	Roles		
	Forecast Analyst: Process Administration	**Forecast Analyst: Planning**	**Forecast Analyst: Analysis**
New Product Forecasting, Assign Project to Forecast	Yes	Yes	Yes
View Comments Manager	Yes	Yes	Yes
Edit Batch Run Details	Yes	No	No
View Reports Workspace	Yes	Yes	Yes
View Administration Workspace	Yes	Yes	No
Administrative Capabilities			
Manage All Forecasts, Plans, and Projects	Yes	No	No
Search Products for Product Lifecycle	Yes	Yes	No
Edit Product Lifecycle for Single Product	Yes	Yes	No
Edit Product Lifecycle for Multiple Products	Yes	Yes	No

Configuring SAS Forecast Analyst Workbench Parameters

Configure Parameters

SAS Forecast Analyst Workbench enables you to configure parameters related to ETL, SAS Forecast Studio, and SAS Financial Management. You should configure these parameters once to meet your business requirements. The ETL and all analytical processes use these parameters for the following purposes:

- extracting data from the solution data layer (SDL) correctly
- acquiring correct paths for integration with SAS Forecast Studio, SAS Inventory Optimization Workbench, and SAS Financial Management
- improving performance

You must configure these parameters before you start any SAS Forecast Analyst Workbench processes.

To configure the parameters:

1. Open SAS Management Console as an unrestricted administrator (sasadm) or as a user who has the capability to configure the parameters.
2. On the **Plug-ins** tab, select **Application Management** ▸ **Configuration Manager** ▸ **Forecast Analyst Config**.
3. Right-click **Forecast Analyst Config**, and click **Properties**. The Forecast Analyst Config Properties dialog box appears.
4. Click the **Advanced** tab and configure the parameters by entering information in the **Property Value** column.

   Note: The properties have default values. You can change these values if the default values are not suitable for your environment.

   For more information about configuration parameters, see "About the Configuration Parameters" on page 35.
5. Click **OK**.

The configuration parameters are defined.

About the Configuration Parameters

The following table describes each configuration parameter and provides an example value.

Table 5.7 *Configuration Parameters*

Parameter	Description	Example of the Parameter Value
GLOBAL_HIGH_DTTM_VALUE	Specifies a globally conventional high date (datetime format) to identify valid records	"01JAN5999:00:00:00"DT
GL_ACCOUNT_ANALYSIS_SWAP_IND	Specifies whether to swap the account variable and the analysis variable in planning. The value `1` indicates to swap the analysis and account variables. The value `0` indicates not to swap.	0
GL_ATTRIB_SELECT_TYPE_THRESHOLD	Specifies the maximum number of attribute values to be displayed as a list in the user interface. If the number of values is greater than this number, the values are displayed in a range filter.	3
GL_CAL_NO_OF_YRS	Specifies the number of years for which the calendar should be generated. **Note:** Do not change this parameter after you have initially generated the calendar. If you specify a different value after the calendar is used in a forecast, the forecasts and plans that use the existing calendar might not work.	20
GL_CAL_YR_START_DT	Specifies the starting date for the calendar. The format of the date must be "DDMMYYYY". **Note:** Do not change this parameter after you have initially generated the calendar. If you specify a different value after the calendar is generated, the forecasts and plans that use the existing calendar might not work.	"01JAN2000"

Parameter	Description	Example of the Parameter Value
GL_CHECK_LOCK_MAX_TIME	Specifies the maximum time a process can check whether a database table is exclusively locked by another process. When a database table is being modified by multiple processes, the first process exclusively locks the database table in order to update it. The rest of the processes wait for the first process to be completed, and then the lock is released. The GL_CHECK_LOCK_MAX_TIME parameter specifies the time in milliseconds that the other processes wait for the lock to be released. Consider increasing the time that is specified by the GL_CHECK_LOCK_MAX_TIME parameter when stored processes are failing due to a locking error.	10000
GL_DATA_STORAGE_PATH	Displays the path in the environment in which all the hierarchical forecasting data sets are created. This path includes actual and predicted results, along with model repositories and events data.	`C:\SAS\Config\Lev1\AppData\SASForecastAnalystWorkbench\data`
GL_DDCF_LOG_CREATION_FLAG	Specifies whether logs should be created at the location that is specified by the GL_FORECAST_LOG_PATH and GL_DDCF_LOG_PATH parameters. The possible values of this parameter are specified by the GL_SHORT_YES and GL_SHORT_NO parameters.	N
GL_DDCF_LOG_PATH	Displays the path in which all logs that are specific to SAS Forecast Analyst Workbench ETL jobs, and to the processes of creating and diagnosing a forecast, and performing collaboration planning are created.	`C:\SAS\Config\Lev1\AppData\SASForecastAnalystWorkbench\ldata\archive`
GL_DDF_ARCHIVE_DIR_PATH	Displays the path in which the archive tables should be created and data should be archived.	`C:\SASForecastAnalystWorkbench`
GL_DDF_CONFIG_DIR_PATH	Displays the solution configuration directory for SAS Forecast Analyst Workbench.	`C:\SAS\Config\Lev1\AppData\SASForecastAnalystWorkbench`
GL_FAW_BL_PSQL_PATH	Specifies the full path to the PSQL executable file of the PostgreSQL database. This file lets the SAS/ACCESS interface call the PostgreSQL PSQL utility.	`C:\Program Files\SASHome\SASWebInfrastructurePlatformDataServer\9.4\bin\psql.exe`
GL_FAW_GRID_APPLICATION_SERVER	Specifies the name of a SAS Application Server that has been defined in the SAS Metadata Repository. If you use SAS Grid Manager, the SAS Application Server contains the definition for the logical grid server that defines the grid environment.	SASApp
GL_FAW_LASRLIBNAME	Specifies the name of the library on the SAS LASR Analytic Server from which data is uploaded to SAS Visual Analytics.	SAS Visual Analytics LASR
GL_FAW_VIYA_CONN_SPAWNER_PORT	Specifies the port number that is used to connect to the SAS Viya server. The value of this parameter and the port number specified for the SAS/CONNECT Spawner must be the same.	17551

Parameter	Description	Example of the Parameter Value
GL_FAW_VIYA_MACHINE	Specifies the IP name or address of the host on which the SAS Viya and SAS/CONNECT server runs.	server01.abc.com
GL_FAW_VIYA_USER	Specifies the user who will connect to the SAS Viya server.	Jim
GL_FM_COMPLEX_EXCHANGE_RATE	Specifies the complex exchange rate selection for SAS Financial Management. This parameter is kept for future use.	Y
GL_FM_DEFAULT_COUNTRY_CD	Specifies the default country code for SAS Financial Management.	US
GL_FM_DEFAULT_LANGUAGE_CD	Specifies the default language code for SAS Financial Management.	en
GL_FM_FACT_LOAD_SOURCE_IND	Specifies whether the data is to be loaded to the Base member or to the BaseForm member of the Source dimension of SAS Financial Management. The value `0` indicates that the data is loaded to the BaseForm member of the Source dimension. The value `1` indicates that the data is loaded to the Base member of the Source dimension.	0
GL_FM_FILTER OPTS_FMQUERY	Excludes missing or zero values while data is extracted from SAS Financial Management. The missing or zero values are excluded to improve the performance of extracting data. The value `0` indicates not to exclude anything. The value `1` indicates to exclude missing values. The value `2` indicates to exclude zero values. The value `3` indicates to exclude zero and missing values.	3
GL_FM_LOAD_STG_GL_TRANS_IND	Excludes missing or zero values while data is loaded into the GL_TRANSACTION_SUM table in the Stage library of SAS Financial Management. The value `0` indicates not to make any change to the data. The value `1` indicates to exclude missing values from the data. The value `2` indicates to exclude missing and zero values from the data.	1
GL_FM_MEMBERS_DIV_NM	Divides the largest dimension into batches of the specified size while data is extracted from SAS Financial Management. For example, suppose you specify 1000, and the dimension that contains the maximum number of members is PRODUCT. In this case, the PRODUCT dimension members are divided into batches of 1000 members while data is extracted from SAS Financial Management.	1000

Parameter	Description	Example of the Parameter Value
GL_FM_SDM_ETLLDFCT_ACTIONTYPE	Specifies whether to delete the entire set of data or to delete only the matching data while data is loaded into the solution data mart in SAS Financial Management. This parameter refers to the actionType input parameter in the etlldfct macro of SAS Financial Management. The value `1` indicates to replace the entire set of data. The value `2` indicates to delete only the matching records. For more information about the actionType input parameter, see the description of the Deletion of Existing Data option in *SAS Financial Management 5.5: Data Administrator's Guide*.	1
GL_FORECAST_DATE	Specifies a date to be used as the forecast date. The forecast starts from the date that you specify. The default value of this parameter is the current date. However, you can provide a specific date (for example, 01JAN2011).	today()
GL_FORECAST_LOG_PATH	Displays the path in which logs related to the HPFDIAGNOSE and HPFENGINE procedures must be generated.	`C:\SAS\Config\Lev1\AppData\SASForecastAnalystWorkbench\HPFLog\`
GL_FORECAST_THREADS_NO	Specifies the number of threads (sessions) to be created for forecasting. This value determines the number of threads to be executed in parallel while a forecast is being diagnosed. When SAS Forecast Analyst Workbench is deployed on a grid, ensure that the number of slots on a grid setup is at least 10. The value of this parameter must always be less than the number of slots that are defined for the grid environment. For more information about using slots on grid setup, *Grid Computing in SAS 9.4* at see http://support.sas.com/documentation/cdl/en/gridref/69583/HTML/default/viewer.htm.	2
GL_FS_PROJ_DATA_STORAGE_PATH	Displays the path in the environment in which all the data sets that are related to modeling project are created. You cannot modify the value of this parameter.	`C:\SAS\Config\Lev1\AppData\SASForecastAnalystWorkbench\data\fs_proj`
GL_FS_PROJ_ENV_DESC	Specifies the description to be assigned to the SAS Forecast Studio environment that is specified by the GL_FS_PROJ_ENV_NM parameter.	FAW Environment
GL_FS_PROJ_ENV_NM	Specifies the name of the SAS Forecast Studio environment to be created.	FAW
GL_FS_PROJ_SASENVIRONMENT	Displays the name of the SAS environment that contains the SAS Forecast Server middle tier. This value is case sensitive.	default
GL_FS_PROJ_WSSERVER	Displays the name of the logical workspace server that is used to create the modeling projects. This parameter is used when environments are created for networked middle-tier servers in SAS Forecast Studio.	`SASApp - Logical Workspace Server`

Parameter	Description	Example of the Parameter Value
GL_INCLUDE_ARCHIVE_IND	Specifies whether to include the archive functionality. The values are `0` or `1`. The value `1` indicates to use archive functionality and the value `0` indicates that archiving should not be used.	1
GL_INCLUDE_SEEDING_IND	Specifies whether seeding should be done. The values are `1` or `0`. The value `1` indicates that seeding is enabled and the value `0` indicates that seeding is disabled.	1
GL_INCLUDE_STAKEHOLDER_DIM_IND	Specifies whether the stakeholder dimension should be added while the collaboration planning process is initiating. Values are `1` and `0`. The value `1` indicates to include the stakeholder dimension. The value `0` indicates not to include the stakeholder dimension.	1
GL_INT_LIB	Specifies the SAS library reference in which the input data set from other applications, such as SAS Inventory Optimization Workbench, and the related configuration tables are made available.	ioint
GL_PLANNING_DATE	Specifies the date to be used as the planning date. The default value of this parameter is the current date. However, you can provide a specific date, such as 01JAN2011.	today()
GL_RUN_DISAGGREGATION_IND	Specifies whether to disaggregate the predicted values for the time series when a forecast is diagnosed. You might want to disaggregate the time series when you are using collaboration planning and product chaining. The value `1` indicates that SAS Forecast Analyst Workbench disaggregates the predicted values for time series. The value `0` indicates that SAS Forecast Analyst Workbench does not disaggregate the predicted values for the time series. When you set this value to `0`, do not use collaboration planning and product chaining.	1
GL_SHORT_NO	Specifies a short value for indicating NO.	N
GL_SHORT_YES	Specifies a short value for indicating YES.	Y
GL_SOURCE_SYSTEM_CD	Specifies the source system code, which is used as input to the SAS Financial Management services.	ETL
GL_TIMESERIES_DIV_NUM	Specifies the size of the time series group. If your site includes many time series in a forecast, increase this value. For example, suppose you specify 100. In this case, a forecast with 5000 time series is split into 50 groups, which impacts performance during the forecasting process. Suppose, on the other hand, you set the value to 5000. This value does not leverage the parallel processing functionality of SAS Forecast Analyst Workbench during the forecasting process.	100
GL_VIYA_CASPORT	Specifies the SAS Cloud Analytic Services server port.	5570

Add Configuration Parameters for Time Series Disaggregation and Database Lock

After you install SAS Forecast Analyst Workbench, you must add the GL_RUN_DISAGGREGATION_IND and GL_CHECK_LOCK_MAX_TIME configuration parameters to specify the settings for time series disaggregation and the maximum time that a process checks the lock of a database table.

To specify the settings for time series disaggregation and database lock:

1. Log on to SAS Management Console as an administrative user (sasadm) or as a user with administrative rights.
2. On the **Plug-ins** tab, select **SAS Management Console** ▸ **Application Management** ▸ **Configuration Manager** ▸ **Forecast Analyst Config**.
3. Right-click **Forecast Analyst Config** and select **Properties**.
4. In the Forecast Analyst Config Properties dialog box, click the **Advanced** tab.
5. On the **Advanced** tab, click **Add**.
6. In the Define New Property dialog box, enter `GL_RUN_DISAGGREGATION_IND` in the **Property Name** field, and enter `1` in the **Property Value** field.

   For more information about the GL_RUN_DISAGGREGATION_IND parameter, see Table 5.7 on page 35.
7. Click **OK** to close the Define New Property dialog box.
8. On the **Advanced** tab, click **Add** to add another parameter.
9. In the Define New Property dialog box, enter `GL_CHECK_LOCK_MAX_TIME` in the **Property Name** field, and enter `10000` in the **Property Value** field.

   For more information about the GL_CHECK_LOCK_MAX_TIME parameter, see Table 5.7 on page 35.
10. Click **OK** to close the Define New Property dialog box.
11. Click **OK** to close the Forecast Analyst Config Properties dialog box.

Running ETL Jobs

After you define the configuration parameters to meet your business requirements, you can run the ETL jobs in order to load the data to solution database. The ETL jobs are located in SAS Data integration Studio. The ETL jobs include the jobs that are related to SAS Forecast Analyst Workbench, SAS Financial Management, customizing SAS Forecast Analyst Workbench, and so on.

For more information about running the ETL jobs, see “Overview of ETL Jobs” on page 63.

Authorizing Users to Access Data

Overview of Authorizing Users

You can authorize a user or group of users and assign permissions to users to access data. Based on your business requirements, you can assign different levels of access to different users or groups of users. For example, you can give User A access to data that is related to Products X and Y and you can give User B access to data that is related to Products V, W, and X.

You use SAS Management Console to provide users with access to data. You can set authorizations after you run the ETL jobs. You might want to update the settings under the following conditions:

- a new user is added to the environment
- new data (for example, a new product or store location) is added to the dimension and you want to assign permissions
- you want to change the permissions that are already assigned to an existing user

Note: Ensure that you authorize users to access data correctly so that they can create a forecast or a new product forecast project in the user interface of SAS Forecast Analyst Workbench.

Make a User or Group Solution Authorized

After you have run the ETL jobs, you can make a user or group solution authorized.

To make the user or group solution authorized:

1. Log on to SAS Management Console as an unrestricted administrator (sasadm) or as a user who has the capability to authorize permissions.
2. On the **Plug-ins** tab, select **Application Management** ▸ **Data Authorization**. The Select Software Component to Connect dialog box appears.
3. Select **Forecast Analyst Mid-Tier**, and then click **OK**.
4. In the **Data Authorization** node of the **Plug-ins** tab, select a user or group of users that is SAS authorized.
5. Right-click the user or group, and select **Add to Solution Authorization**.

The **Solution Authorized** column displays **Yes** for the user or the group. That user or group is authorized to access the solution.

Assign Permissions to a User to Access Data

After you have run the initial and ongoing jobs, you can assign permissions to a user to access the data.

To assign permissions to a user to access data:

1 Log on to SAS Management Console as an unrestricted user (sasadm) or as a user who has the capability to authorize to the data.

2 On the **Plug-ins** tab, select **Application Management** ▸ **Data Authorization**. The Select Software Component to Connect dialog box appears.

3 Select **Forecast Analyst Mid-Tier**, and then click **OK**.

4 In the **Data Authorization** node, select a user that is solution authorized.

5 Right-click the user, and select **Update Permissions**. The Update Permissions dialog box appears.

6 Enter the appropriate information in the Update Permissions dialog box. The following table describes the fields in the Update Permissions dialog box.

Table 5.8 Fields in the Update Permissions Dialog Box

Field	Description
Select dimension	Select a dimension from the list (for example, **PRODUCT**).
From level	Select the hierarchy level at which you want to begin to give permission to the user. For example, select **Segment**. **Note:** This list is available only when you select a dimension that contains hierarchical data.
To level	Select the lowest level of the hierarchy for which you want to provide permission to the user (for example, **Product name**). The user can access all hierarchy levels from the level that you specified in the **From level** field through the level that you selected in the **To level** field. **Note:** This list is available only when you select a dimension that contains hierarchical data. **Note:** If the user will perform product succession, you must provide access to the lowest-level data (leaf-level data) for all dimensions to that user.
Copy Permissions	Click this button to copy permissions from another user. When you click this button, the Copy Permissions dialog box appears. Select a user whose permissions you want to copy and click **OK**.
Search	Enter a member of the hierarchy level or the value of the hierarchy level, and click **Search**. The Update Permissions dialog box displays the members or values that satisfy the search criteria.
Member	Displays the name of the hierarchy value or the name of the member, based on the **From level** value that you selected.

Field	Description
Read	Select this check box to permit the user to access the hierarchy level. When incremental data is loaded into SAS Forecast Analyst Workbench, you might want to give users Read permissions to new members that were added to existing dimensions. For example, you might want to give users Read permissions to new customers in a CUSTOMER dimension and to new categories in a PRODUCT dimension. In a hierarchical dimension, if you give a user Read permission to the node at which a new member was added, all members that are added below that hierarchical node inherit the Read permission. For example, suppose you provide Read permissions to the newly added category Monitors in the PRODUCT dimension. In this case, the LCD Monitors sub-category that is also newly added to the Monitors category inherits the Read permissions.

Note: In order to work on New Product Forecast projects, the user must have permission for at least one value for each dimension.

7 Click **OK**.

The **Permissions** column displays **Yes**. The selected user is permitted to access the selected data.

Assigning Permissions to a User or Group for a Forecast, for a Modeling Project, or for a Plan

Users in SAS Forecast Analyst Workbench cannot access forecasts, modeling projects, or collaboration plans that are created by other users. You must provide permissions to the user for the forecasts, modeling projects, or plans created by another user. For example, you can assign permissions to User B (who is a forecast analyst) for a plan that User A (who is a planner) creates so that User B can perform model-management tasks.

Note: Always share the forecast with a user (instead of with a group) so that the user can create an analysis based on the shared forecast.

Whenever a forecast, modeling project, or plan is created, a smart object for that forecast, modeling project, or plan is created in SAS Management Console. You should provide permission to the user on the smart object that is created in SAS Management Console.

To assign a user permissions to access a forecast, modeling project, or plan that another user created:

1 Log on to SAS Management Console as an unrestricted administrator or as a user who has the capability to assign permissions.

2 On the **Folders** tab, select **SAS Folders** ▸ **Products** ▸ **SAS Forecast Analyst Workbench** ▸ **5.3 Smart Objects**.

The **5.3 Smart Objects** folder contains three folders: the **ForecastPlan** folder contains the smart objects that are created for forecasts; the **ForecastStudioProject** folder contains the smart objects that are created for

modeling projects; and the **CollaborationPlan** folder contains the smart objects that are created for plans.

3 Perform one of the following steps:

- If you want to assign permissions for a forecast, select the smart object for the plan in the **ForecastPlan** folder, right-click the object, and select **Properties**. The Properties dialog box appears.
- If you want to assign permissions for a modeling project, select the smart object for the modeling project in the **ForecastStudioProject** folder, right-click the object, and select **Properties**. The Properties dialog box appears.
- If you want to assign permissions for a plan, select the smart object for the plan in the **CollaborationPlan** folder, right-click the object, and select **Properties**. The Properties dialog box appears.

4 In the Properties dialog box, click the **Authorization** tab.

5 Click **Add**. The **Add Users and Groups** dialog box appears.

6 Select the user, and click **OK**. The user is added to the **Authorization** tab.

7 On the **Authorization** tab, select the user, and grant permissions.

8 Click **OK**.

Establishing a Bridge from SAS Forecast Analyst Workbench to SAS Viya

Performing Remaining Tasks To Set Up the Bridge

Perform the following tasks to finish setting up the bridge from SAS Forecast Analyst Workbench to SAS Viya using SAS/CONNECT. These tasks are the remaining tasks that you perform apart from the settings that you specified in "SAS Deployment Wizard Tasks" on page 16.

(Optional) Include SAS Cloud Analytics Server Host Name

Suppose you are performing three-stage modeling analysis (an out-of-the-box analysis) on SAS Viya, and SAS Viya and SAS Cloud Analytics Server are deployed on different servers. In such a case, perform the following steps to include the SAS Cloud Analytics Server host name:

1 Edit the CAS host name in the following statement in the ddcf_ca_3stg_viya_subdata_mac.sas file:

```
libname fawcas CAS  host = "&gl_faw_viya_machine" port = &gl_viya_casport.
 datalimit=ALL READTRANSFERSIZE=3G ;
```

Note: On Windows, the path for the ddcf_ca_3stg_viya_subdata_mac.sas file is ***SASHome*\SASFoundation\9.4\ddcfsrv\sasmisc\ddcf_ca_3stg_viya_subdata_mac.sas**. On UNIX, the path for the ddcf_ca_3stg_viya_subdata_mac.sas file is ***SASHome*/**

SASFoundation/9.4/misc/ddcfsrv/ddcf_ca_3stg_viya_subdata_mac.sas.

2 Save the ddcf_ca_3stg_viya_subdata_mac.sas file.

3 Enter the path of the ddcf_ca_3stg_viya_subdata_mac.sas file in the following statement, and then add the statement before the %macro statement in the ddcf_ca_three_stage_model_Viya.sas file:

```
%include "path\ddcf_ca_3stg_viya_subdata_mac.sas";
```

Note: On Windows, the path for the ddcf_ca_three_stage_model_Viya.sas file is ***SASHome*\SASFoundation\9.4\ddcfsrv\sasstp\ddcf_ca_three_stage_model_Viya.sas**. On UNIX, the path for the ddcf_ca_three_stage_model_Viya.sas file is ***SASHome*/SASFoundation/9.4/sasstp/ddcfsrv/ddcf_ca_three_stage_model_Viya.sas**.

4 Save the ddcf_ca_three_stage_model_Viya.sas file.

Start SAS/CONNECT Spawner on the SAS Viya Server

1 In the command prompt, go to the directory where SAS/CONNECT Spawner is installed.

For example, go to **/opt/sas/viya/home/SASFoundation/utilities/bin**.

2 In the command prompt, enter the following command: ./cntspawn -service *port number* -sascmd *directory where SAS is deployed*

For example, enter the following command when the port number is 17551 and SAS is deployed at **/opt/sas/viya/home/SASFoundation/sas**:

```
./cntspawn  -service 17551  -sascmd /opt/sas/viya/home/SASFoundation/sas
```

Setting Up the Bridge After Deployment

Perform the following tasks if you did not set up a bridge from SAS Forecast Analyst Workbench to SAS Viya using SAS/CONNECT when you deployed SAS Forecast Analyst Workbench.

(Optional) Include SAS Cloud Analytics Server Host Name

Suppose you are performing three-stage modeling analysis (an out-of-the-box analysis) on SAS Viya, and SAS Viya and SAS Cloud Analytics Server are deployed on different servers. In such a case, perform the following steps to include the SAS Cloud Analytics Server host name:

1 Edit the CAS host name in the following statement in the ddcf_ca_3stg_viya_subdata_mac.sas file:

```
libname fawcas CAS  host = "&gl_faw_viya_machine" port = &gl_viya_casport.
 datalimit=ALL READTRANSFERSIZE=3G ;
```

Note: On Windows, the path for the ddcf_ca_3stg_viya_subdata_mac.sas file is ***SASHome*\SASFoundation\9.4\ddcfsrv\sasmisc**

\ddcf_ca_3stg_viya_subdata_mac.sas. On UNIX, the path for the ddcf_ca_3stg_viya_subdata_mac.sas file is ***SASHome*/SASFoundation/9.4/misc/ddcfsrv/ddcf_ca_3stg_viya_subdata_mac.sas**.

2 Save the ddcf_ca_3stg_viya_subdata_mac.sas file.

3 Enter the path of the ddcf_ca_3stg_viya_subdata_mac.sas file in the following statement, and then add the statement before the %macro statement in the ddcf_ca_three_stage_model_Viya.sas file:

```
%include "path\ddcf_ca_3stg_viya_subdata_mac.sas";
```

Note: On Windows, the path for the ddcf_ca_three_stage_model_Viya.sas file is ***SASHome*\SASFoundation\9.4\ddcfsrv\sasstp\ddcf_ca_three_stage_model_Viya.sas**. On UNIX, the path for the ddcf_ca_three_stage_model_Viya.sas file is ***SASHome*/SASFoundation/9.4/sasstp/ddcfsrv/ddcf_ca_three_stage_model_Viya.sas**.

4 Save the ddcf_ca_three_stage_model_Viya.sas file.

Specify Configuration Parameters to Connect to SAS Viya

You must specify values for the following configuration parameters to connect to SAS Viya:

- GL_FAW_VIYA_CONN_SPAWNER_PORT
- GL_FAW_VIYA_MACHINE
- GL_FAW_VIYA_USER
- GL_VIYA_CASPORT

For more information about these configuration parameters, see “About the Configuration Parameters” on page 35.

(Optional) Set Up Configuration Properties to Connect to SAS Viya

You might want to set up the configuration properties so that the required configuration information is automatically included when you migrate or upgrade to a newer version of SAS Forecast Analyst Workbench.

To set up the configuration properties to connect to SAS Viya, perform the following steps:

1 Log on to SAS Management Console as a user who can configure properties.

2 In SAS Management Console, select **Folders** ▸ **System** ▸ **Applications** ▸ **SAS Forecast Analyst Workbench**.

3 In the right pane of the SAS Management Console, right click **Forecast Analyst Config**, and click **Properties**.

4 In the Forecast Analyst Config Properties dialog box, click the **Configuration** tab, and then edit the following configuration properties.

Table 5.9 Description of Configuration Properties to Connect to SAS Viya

Configuration Property	Description
data.ddcfsrvc.connecting_to_viya	Set the value of the configuration property to `True` to connect to SAS Viya.
data.ddcfsrvc.viya.connect.cas.port	Specify the port number on which the SAS Cloud Analytics Services Server is listening. For example, specify `5570`.
data.ddcfsrvc.viya.connect.host.name	Specify the host name of the SAS Viya server on which SAS/CONNECT is running.
data.ddcfsrvc.viya.connect.spawer.port	Specify the port number where the SAS/CONNECT Spawner that is present on the SAS Viya server is listening. For example, specify `17551`.
data.ddcfsrvc.viya.connect.userid	Specify the user ID that is required to connect to SAS Viya. **Note:** The user ID that you specify must be the same as the one you entered in the GL_FAW_VIYA_USER parameter. For more information about GL_FAW_VIYA_USER parameter, see "About the Configuration Parameters" on page 35.

5 Click **OK**.

Start the SAS/CONNECT Spawner on the SAS Viya Server

For more information, see "Start SAS/CONNECT Spawner on the SAS Viya Server" on page 45.

Specify User Credentials in the Middle-Tier to Connect to SAS Viya

1 Log on to SAS Management Console as a user who can configure properties.

2 In SAS Management Console, select **Folders** ▸ **System** ▸ **Applications** ▸ **SAS Forecast Analyst Workbench**.

3 In the right pane of the SAS Management Console, right click **Forecast Analyst**, and click **Properties**.

4 In the Forecast Analyst Properties dialog box, click the **Configuration** tab, and then edit the following configuration properties.

Table 5.10 Description of Configuration Properties to Connect to SAS Viya

Configuration Property	Description
midtier.ddcfmid.viya.connect.userid	Specify the user ID to connect to SAS Viya. **Note:** The user ID that you specify must be the same that you entered in the GL_FAW_VIYA_USER parameter. For more information about GL_FAW_VIYA_USER parameter, see "About the Configuration Parameters" on page 35.

Configuration Property	Description
webapp.ddcfmid.connecting_to_viya	Set the value of the configuration property to `True` to connect to SAS Viya.

5 Click **OK**.

Specify User Credentials in SAS Deployment Manager to Connect to SAS Viya

In order to connect to SAS Viya on an already deployed and configured site of SAS Forecast Analyst Workbench, perform the following steps:

1 On Windows environment of the middle tier, double-click ***SASHome*`\SASDeploymentManager\9.4\sasdm.exe`**.

On UNIX environment of the middle tier, launch ***SASHome*`/SASDeploymentManager/9.4/sasdm.sh`**.

2 In the **Select SAS Deployment Manager Task** step of the SAS Deployment Manager wizard, select **Update Passwords** option and click **Next**.

3 Select configuration directory and configuration level, and then click **Next**.

4 Enter medatadata user's password and click **Next**.

5 Enter the SAS Web Infrastructure database administrator's password then click **Next**.

6 Select the user ID and click **Next**.

Note: The user ID that you select must be the same that you entered in the GL_FAW_VIYA_USER parameter. For more information about GL_FAW_VIYA_USER parameter, see "About the Configuration Parameters" on page 35.

7 Enter and confirm the password, and then click **Next**.

8 Review the summary and click **Start**.

9 After the SAS Deployment Manager completes the process of updating password, click **Finish**.

A web browser appears and shows the summary of passwords that are updated.

Performing Miscellaneous Tasks

Change the Log Level for Web Application Server

Change the log level for the web application server to get better insights into the issues that you might be experiencing on web application server.

To change the log level for web application server:

1. On the web application server, open the following location: ***SAS-configuration-directory*\Lev1\Web\Common\LogConfig**
2. In the **LogConfig** directory, right-click the **SASForecastAnalystWorkbench-log4j.xml** file, point to **Open with**, and select **Notepad** to edit the file.
3. Change the priority value to the required level.

   Use the priority value DEBUG for obtaining a detailed log, and use ERROR to obtain error messages.
4. Save the file.

Verify the Default Path of Log Files

SAS Forecast Analyst Workbench generates different log files. You can view the log files to obtain detailed information about the tasks that you have performed. SAS Forecast Analyst Workbench creates the following log files:

- SAS Forecast Analyst Workbench log file, which is located at ***SAS-configuration-directory*/Levn/Web/Logs/SASServer8_1/SASForecastAnalystWorkbench5.3.log**

  Note: If you deployed SAS Forecast Analyst Workbench in a multi-machine environment, this log file is created on the middle-tier machine.
- Stored Process logs are stored at ***SAS-configuration-directory*/Levn/SASApp/StoredProcessServer/Logs**

  Note: If you deployed SAS Forecast Analyst Workbench in a multi-machine environment, these logs are stored on the server-tier machine.
- The logs that are created for SAS Financial Management processes that are run through SAS Forecast Analyst Workbench are stored in the path that you specified in the GL_DDCF_LOG_PATH parameter. In order to use the path that is specified in the GL_DDCF_LOG_PATH parameter, ensure that the GL_DDCF_LOG_CREATION_FLAG parameter contains the **Y** parameter value.
- The forecasting-related logs are stored in the path that you specified in the GL_FORECAST_LOG_PATH parameter.

  SAS Forecast Analyst Workbench stores the forecasting-related logs if the GL_DDCF_LOG_CREATION_FLAG path is set to **Y**.

Disable the SAS Visual Analytics Hub

After you deploy SAS Forecast Analyst Workbench, the SAS Visual Analytics Hub is also installed and deployed by default. However, you can disable SAS Visual Analytics Hub.

To disable SAS Visual Analytics Hub:

1. Log on to SAS Management Console as an unrestricted administrator (sasadm).
2. On the **Plug-ins** tab, select **Application Management** ▸ **Configuration Manager** ▸ **SAS Application Infrastructure** ▸ **Forecast Analyst Mid-Tier**.

3 Right-click the **Forecast Analyst Mid-Tier** node, and select **Properties**. The Forecast Analyst Mid-Tier Properties dialog box appears.

4 Click the **Advanced** tab, and set ENABLE_APPLICATION_SWITCHER parameter to `0`.

5 Click **OK**.

6 Stop SASServer 12.

7 Restart SASServer 8 for the changes to take effect.

Allocate Required Space for a Java Virtual Machine

When you are integrating SAS Financial Management with SAS Forecast Analyst Workbench for performing collaboration, you might need to allocate additional space for its Java virtual machines (JVM). By allocating necessary space to the appropriate JVMs, you ensure that the data is loaded smoothly and quickly to SAS Financial Management. If sufficient space is not available to the JVM, the faw_0605_load_fm_sdm_dimensions job might fail.

For information about allocating the needed space for a JVM, see *SAS Financial Management 5.5: Performance Guide* at http://support.sas.com/documentation/solutions/performmanagement/fm/5.5/fmsprfg.pdf.

Similarly, you might also need to allocate additional space for the JVM (by modifying the -Xms and -Xmx settings) of SASServer1 so that the custom analysis runs smoothly. For more information about modifying the -Xms and -Xmx settings in the JVM options to allocate the needed space for a JVM of SASServer1, see “Specifying JVM Options” in *SAS 9.4 Intelligence Platform: Middle-Tier Administration Guide* at http://support.sas.com/documentation/cdl/en/bimtag/69826/PDF/default/bimtag.pdf.

Set the Stored Process Flush Log Timeout

You might want to set the Stored Process flush log timeout so that the custom analysis runs smoothly.

1 Log on to SAS Management Console as an unrestricted administrator (sasadm).

2 On the **Plug-ins** tab, select **Environment Management** ▸ **Server Manager** ▸ **SASApp** ▸ **SASApp - Logical Stored Process Server**.

3 Right-click the **SASApp - Logical Stored Process Server** node, and select **Properties**. The SASApp - Logical Stored Process Server Properties dialog box appears.

4 On **Options** tab, click **Set Server Properties**.

5 On the **Context** tab of the Stored Process Server Properties dialog box, enter a value for the **Flush Log Timeout (s)** field.

Consider the size of the data and the Stored Processes that might run during a custom analysis when you set the timeout value.

6 Click **OK** to close the Stored Process Server Properties dialog box.

7 Click **OK** to close the SASApp - Logical Stored Process Server Properties dialog box.

Specify Automatic Sending of Emails

You can specify that an automatic email should be sent to stakeholders when forms are published. In order to send an automated email, you must ensure that the email addresses for stakeholders are specified in SAS Management Console.

To specify this setting:

1 Log on to SAS Management Console as an unrestricted administrator (sasadm).

2 On the **Plug-ins** tab, select **SAS Management Console** ▸ **Application Management** ▸ **Configuration Manager** ▸ **SAS Application Infrastructure**.

3 Right-click **SAS Application Infrastructure** and select **Properties**. The SAS Application Infrastructure Properties dialog box appears.

4 Click **Settings**.

5 On the **Settings** tab, click **Notifications**. The **Notifications > General Configuration** settings appear.

6 In the **Notifications > General Configuration** section, select **E-mail** as the alert notifications type.

7 Click the **Advanced** tab, and specify the correct values for **Email.Host** and **Email.Port**.

8 Click **OK**.

Set Up the Environment for SAS Forecast Studio on UNIX

When you are deploying SAS Forecast Studio, you must specify a umask setting of `002`. If you do not specify `002`, then you must provide permission `775` to the ***`SAS-configuration-directory`*`\Levn\AppData`** folder. For more information, see *SAS Forecast Server 14.2: Administrator's Guide* at http://support.sas.com/documentation/solutions/forecast/index.html#forecastcurrent.

Limit the Reach of SAS Server Processes

You can limit the reach and activities of a SAS server by putting it in a locked-down state. The lockdown feature is not supported by SAS Forecast Analyst Workbench. For more information, see *SAS Intelligence Platform: Security Administration Guide* at http://support.sas.com/documentation/cdl/en/bisecag/67045/PDF/default/bisecag.pdf.

Support Single Sign-on

You can configure single sign-on (SSO) to bypass the initial or secondary logon prompts. However, single sign-on is not supported by SAS Forecast Analyst Workbench and other solutions that are an integral part of SAS Forecast Analyst Workbench (such as SAS Forecast Studio) when you configure SAS at your site by using IBM WebSEAL, Integrated Windows Authentication, or CA Single Sign-On (formerly CA SiteMinder). For more information about single sign-on and IBM WebSEAL, see http://support.sas.com/kb/54/859.html.

Set Up Digital Certificates on a Secured Environment

You might need to set up digital certificates on a secured environment so that SAS Forecast Analyst Workbench works smoothly. You can set up the SAS root certification authority to the trusted root certification authority.

To set up digital certificates on a secured environment and to specify settings related to the Federal Information Processing Standard (FIPS), see *Encryption in SAS 9.4* at http://support.sas.com/documentation/cdl/en/secref/69831/HTML/default/viewer.htm#titlepage.htm.

Allocate Memory for Generating Forecasts Automatically

When you are running the **/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave03/faw_0304_execute_auto_detect_train** job in SAS Data Integration Studio, you might receive an error that states that your computer has insufficient memory. The amount of space required depends on the parameters that you select for generating the forecast automatically and the size of the data in the SDL library for generating scorecards.

To fix the error:

1. Open **<SAS Home>\SASFoundation\9.4\nls\en\sasv9.cfg**.
2. Replace `-WORK "!TEMP/SAS Temporary Files"` with `-WORK` and a path to another location that contains sufficient memory. For example, the new path might be `-WORK "C:\SAS\TEMP"`.
3. Save and close the file.
4. Restart SAS Data Integration Studio.
5. (Optional) Repeat steps 1 through 4 until the error goes away when you are running the faw_0304_execute_auto_detect_train job.

Authorize Users to Access SAS Forecast Analyst Workbench Application Data Directory

When you deploy SAS Forecast Analyst Workbench on a grid, ensure that you authorize users with Read and Write permission to access the **SAS-configuration-directory/Levn/AppData/SASForecastAnalystWorkbench** directory and its all subdirectories. You must

also ensure that the **`SAS-configuration-directory/Levn/AppData/SASForecastAnalystWorkbench`** directory is accessible by all grid nodes.

Part 3

Data Management

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Flow of Data in SAS Forecast Analyst Workbench

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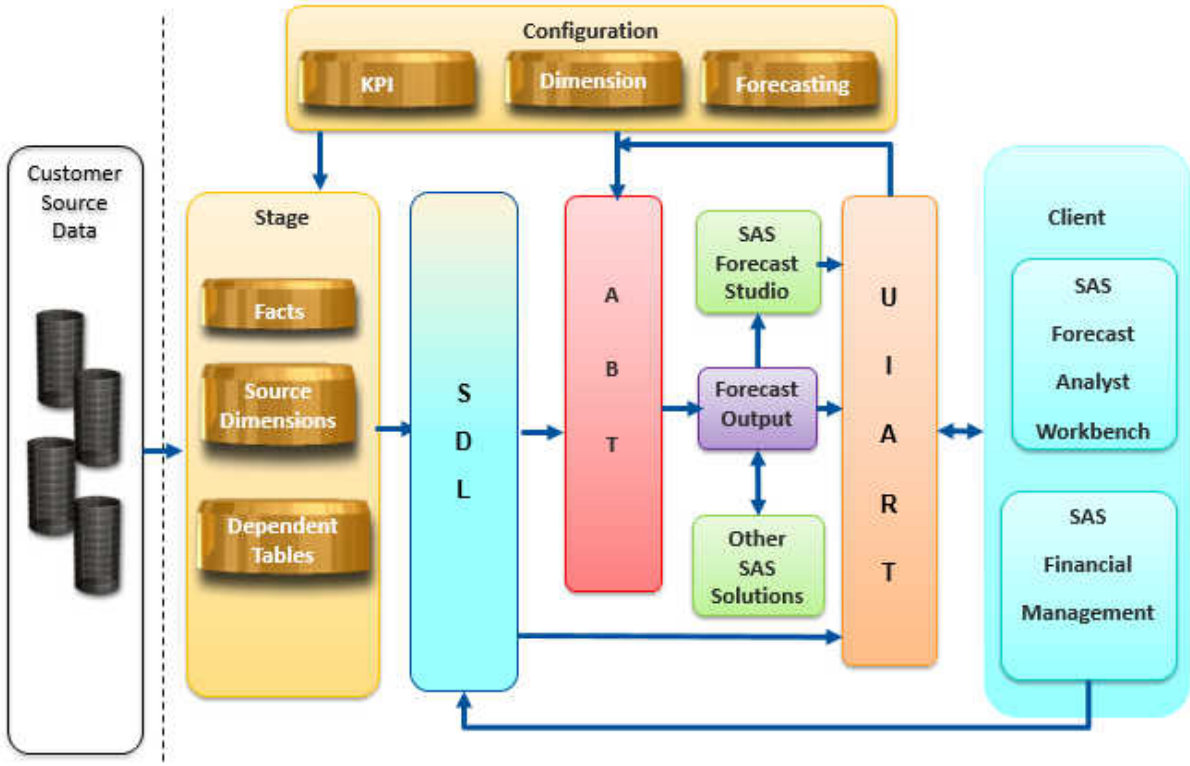
Loading and Accessing Data

The data moves from its source, through the staging area, to the solution data layer, to the user interface analytical result tables (UIART). This section describes the flow of the data throughout the SAS Forecast Analyst Workbench environment. The following figure shows the data flow.

Figure 6.1 Data Flow Diagram



The complete path that the data follows consists of the following main steps:

1 Extract the data from your source systems and load it into the staging area and then to solution data layer. In order to load the data into the stage area, perform the following tasks:

   a As an administrator, after you deploy SAS Forecast Analyst Workbench and enter information in the configuration parameters, run the configuration jobs. The configuration jobs create the configuration tables.

   b Enter information in the configuration tables to meet your business requirements and data availability.

   c After you update the configuration tables, run the initial jobs. The initial jobs use the information that you entered in the configuration tables to create the stage tables and the solution data layer tables. You must map the stage tables with your source system tables and load the data.

   You must update the stage tables whenever the source system is updated or refreshed.

   For more information about running configuration jobs, see “Running Configuration Jobs” on page 65.

   For more information about running initial jobs, see “Running Initial Jobs” on page 67.

   For more information about loading information into the stage area, see “Loading Data into the Stage Area” on page 68.

2 Run the ongoing ETL jobs to perform the following tasks:

- load dimension tables with the latest data from the stage tables
- load user interface analytical result tables (UIART) with the latest data from the solution data layer

Whenever stage tables are refreshed or updated, update the solution data layer (SDL) tables, dimension tables, and UIART by running the ongoing jobs. After the dimension tables and the UIART are loaded, the user interface for SAS Forecast Analyst Workbench is ready to use.

For more information about running the ongoing jobs, see "Running Ongoing Jobs" on page 71.

3 In SAS Management Console, provide the required authorization to the users and groups, and then provide the required permissions to access the data.

For more information, see Chapter 5, "Performing Post-installation Tasks," on page 21.

4 Use SAS Forecast Analyst Workbench to create forecasts, diagnose them, and perform the activities related to forecasting and planning. The following list explains how the data flows through SAS Forecast Analyst Workbench when you are working in the user interface:

- When you create forecasts, SAS Forecast Analyst Workbench extracts data from the SDL and configuration libraries, and loads it in the analytical base tables (ABTs). SAS Forecast Analyst Workbench also creates forecast-specific folders in the path that you specify in the configuration parameters. The data that is related to the forecast is loaded in these folders.

  For more information about the configuration parameters, see "About the Configuration Parameters" on page 35.

- When you diagnose forecasts, SAS Forecast Analyst Workbench sends the data to high-performance forecasting processes, and then loads the forecasted data into the forecasting tables
- When you integrate the forecasts with SAS Forecast Studio, the data is provided to SAS Forecast Studio and the output is loaded into the library that you specified in the configuration parameters

  For more information about the configuration parameters, see "About the Configuration Parameters" on page 35.

- When you integrate the plans with SAS Financial Management, the plan-level data is loaded in SAS Financial Management to use for performing collaboration planning.

SAS Forecast Analyst Workbench can be integrated with other SAS solutions, such as SAS Inventory Optimization Workbench.

Configuring Data for SAS Forecast Analyst Workbench

SAS Forecast Analyst Workbench enables you to customize your deployment, based on your business requirement. You can customize the deployment of SAS Forecast Analyst Workbench in the following ways:

- add a custom calendar for collaboration

  By adding a custom calendar for collaboration, you can perform collaboration planning by using a custom calendar. This capability is useful when the financial year is different from the Gregorian calendar and you want to perform collaboration planning based on the financial year.

- add an alternate hierarchy for collaboration

  When you want to perform the collaboration on a hierarchy that is different from the default one, add an alternate hierarchy to an existing dimension. For example, suppose the PRODUCT dimension contains the default hierarchy as category, sub-category, and product name. To get a broad idea of demand and to perform collaboration, you can choose an alternate hierarchy with the following levels: segment, class, and product name.

- extract the data of all stakeholders of a plan

  When you are performing collaboration through SAS Forecast Analyst Workbench, you can extract the data of only the default stakeholder. When you want to perform the analysis on the data of all stakeholders, you can extract the data and analyze it in SAS Visual Analytics.

- add a dimension to an existing plan

  You can add a dimension to an existing plan when you want to perform the collaboration on an additional dimension. For example, suppose plan ABC contains PRODUCT and CUSTOMER dimensions, and you have performed collaboration planning. Later, you can add another dimension, QUALITY, in order to plan ABC to rate the inputs that you obtained during collaboration.

  You must plan for the dimension that you want to use as an additional dimension while you are configuring SAS Forecast Analyst Workbench.

- perform multi-tier causal analysis

  By using multi-tier causal analysis, you can link a series of quantitative methods together to measure the impact of sales and marketing strategies on the consumer demand. Then, using the coefficients of the demand model, multi-tier causal analysis executes what-if scenarios to shape and predict the demand. Finally, demand and supply are linked using analytics rather than by using just judgment.

  In order to perform multi-tier causal analysis, you must plan the independent variable that you want to use as a KPI while you are configuring SAS Forecast Analyst Workbench.

- use a custom model

  You can write the code for user-defined forecast models that you want to use to forecast the demand for new products.

- archive data for reporting

  You can archive the output data of a forecast and a plan for reporting. The sales and operations planning processes can use this data for additional analysis.

- seed analysis variables

You can cohesively consider all the business requirements and customizations that are available, and then configure the data accordingly so that you can use SAS Forecast Analyst Workbench seamlessly. For more information, see the appendixes in this document.

Libraries In SAS Forecast Analyst Workbench

SAS Forecast Analyst Workbench organizes the files in different libraries according to the subject areas that they belong to. SAS Forecast Analyst Workbench contains the following libraries:

FAW Analytical Base Tables
contains tables that are created in the form that is required for high-performance forecasting-based procedures. These tables are created by transforming, filtering, and aggregating the data that is present in the solution data layer tables. The ABTs are used as input to the analytical procedures.

FAW Configuration Tables
contains tables that consist of configuration-related information. Update the configuration tables with your business-specific information.

FAW Staging Data Layer Tables
contains dimension tables, dimension-dependent tables, and fact data tables. These tables need to be loaded with business-specific source system data.

FAW Internal Temporary Tables
contains intermediate or temporary tables that are used in various processes.

FAW Solution Data Layer Tables
contains dimension tables, dimension-dependent tables, and facts data tables. These tables are loaded from data that is in the stage tables.

FAW UI Analytical Result Tables (Transaction)
contains application tables consisting of information that is required to display the SAS Forecast Analyst Workbench user interface. These tables reside in a PostgreSQL database.

FAW Analytical Result Tables (SAS)
contains the SAS data set tables that are required to display the SAS Forecast Analyst Workbench user interface.

FAW Custom Model Repository Tables
contains the data tables that are related to modeling projects.

FAW Control Tables
contains tables that consists of control-related information that is used to create ABTs.

FAW Plan Exploration Tables
contains the dimension and fact data tables for each forecast. This information is used to display the KPI values for the dimension that the user selected in the Explore Demand view of the application.

FAW New Product Forecasting Tables
contains tables that are specific to forecasting new products.

Visual Analytics Integration Tables
contains tables with data for generating SAS Forecast Analyst Workbench reports in SAS Visual Analytics.

7

ETL Tasks

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Overview of ETL Jobs

After you complete the post-installation tasks, you can perform the following tasks in order to prepare SAS Forecast Analyst Workbench data:

1. run configuration jobs
2. update configuration tables
3. run initial jobs
4. load data from the customer source database into the stage area
5. run ongoing jobs
6. authorize users to access data

Configuring Parameters

After you install SAS Forecast Analyst Workbench , you must configure the parameters that are related to SAS Forecast Analyst Workbench. Configure these parameters to meet your business requirements.

For more information about configuring parameters, see “Configuring SAS Forecast Analyst Workbench Parameters” on page 34.

Preparing SAS Forecast Analyst Workbench Data

Overview of Preparing Data

Data in SAS Forecast Analyst Workbench flows from its source (a customer database) to the stage area, and then through the solution data layer (SDL), to a destination data mart called the user interface analytical result tables (UIART).

The sources of the data can be transactional systems or databases that are outside the SAS Forecast Analyst Workbench environment. The table structures in the stage area and in the SDL are created based on the information that you provide in the configuration tables. You must load the data from source system (the customer system) to the stage area and then from the stage area into the SDL. This process is ongoing.

Run Jobs to Load Data

When you are running the ETL jobs, the following prerequisite applies:

- You must be a member of the Forecast Analyst ETL Users group, which was created in metadata during the configuration process.

To prepare the data for SAS Forecast Analyst Workbench:

1. Run the configuration jobs that are in SAS Data Integration Studio at the following location: **`/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave00 (Configuration)`**

   You must run the configuration jobs only once immediately after you deploy SAS Forecast Analyst Workbench. The configuration tables (for example, DIM_TABLE_LIST, KPI_CONFIG, or CREATE_EVENT) are created when you run the configuration jobs. After the configuration tables are created, enter information that meets your business requirements in the configuration tables.

   For more information about running configuration jobs, see “Running Configuration Jobs” on page 65.

2. Run the initial one-time jobs that are in SAS Data Integration Studio at the following location: **`/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave01 (Initial One Time)`**.

You must run the initial one-time jobs only once immediately after you deploy SAS Forecast Analyst Workbench and edit the configuration tables. After you run the initial one-time jobs, the following steps are performed:

a The table structures in the stage area and the SDL, and a few control tables, are created by the initial jobs, based on the information that you entered in the configuration tables.

b The time period and time dimension data is created, based on the information that is specified by the configuration parameters. You can modify the configuration parameters.

SAS Forecast Analyst Workbench creates the Gregorian calendar based on the information that you specified in the configuration parameters.

c The application configuration tables are created.

For more information about running initial jobs, see "Running Initial Jobs" on page 67.

3 Run the ongoing jobs that are in the following directories through SAS Data Integration Studio in order to load data from the stage area to the SDL, and then load the required UIART tables:

- `/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave02`

  Before you run this job, you must ensure that the customer data is loaded into the stage tables. When you run the `Wave02` jobs, SAS Forecast Analyst Workbench loads the data from the stage area to the SDL.

- `/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave03`

These jobs populate the data that must be displayed in the user interface, along with the following data, while a user is creating a forecast:

- list of KPIs
- associated dimensions for each KPI
- hierarchy levels, hierarchy values, and attributes that are associated with each dimension
- independent variables and adjustment tables that are associated with each KPI
- events

You must run these jobs whenever new source data is loaded into the stage area.

Each of these steps is described in detail in the following sections. After you have performed all these steps, users can open the user interface of SAS Forecast Analyst Workbench to start forecasting values.

Running Configuration Jobs

The configuration jobs create configuration tables. You must run the configuration jobs that are in SAS Data Integration Studio in the following sequence:

1. faw_0001_generate_config_datamart
2. faw_0002_populate_dependent_config_tables

The configuration jobs are in SAS Data Integration Studio at the following location: **`/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave00 (Configuration)`**

After you run the configuration jobs, the configuration tables are created. Before you can run the initial jobs and the ongoing jobs, you must enter the information in the configuration tables to meet your business requirements. The initial jobs and ongoing jobs use the information that you specify in the configuration tables.

The following table describes the configuration jobs in detail.

Table 7.1 *Configuration Jobs*

Job Name	Job Description	Required Inputs
faw_0001_generate_config_datamart	Creates the following configuration tables in the configuration library. You must provide information in these tables to meet your business requirements. ■ DIM_TABLE_LIST ■ INDEP_VAR_TABLE ■ CREATE_EVENT ■ EVENT_REQUIRED ■ FORECAST_INTERVAL ■ INDEP_AGGRE_METHOD ■ ANALYSIS_VAR ■ HPF_PREFFERENCES ■ NPF_MODEL_LOOKUP ■ NPF_REDUCTION_METHODS ■ NPF_CONFIG ■ DIM_HIERARCHY ■ CONSENSUS_PLAN_TEMPLATE_LIST ■ LOAD_TYPE **Note:** You must edit these tables before you run the faw_0002_populate_dependent_config_tables job.	None
faw_0002_populate_dependent_config_tables	Creates the following dependent configuration tables in the configuration library. The information in these tables is based on the information that you provided in the configuration tables. ■ KPI_CONFIG ■ DIM_VAR_DISP_LIST ■ DIM_HIERARCHY_LVL ■ ANALYSIS_VAR_X_LOAD_TYPE	Information that you entered in the configuration tables that are created by the faw_0001_generate_config_datamart job.

Note: Before you run the initial jobs, you must edit the values in the editable columns of the tables that are created by the configuration jobs.

Running Initial Jobs

Immediately after you deploy SAS Forecast Analyst Workbench, you must run the initial jobs. The initial jobs create and load the initial tables. You can rerun the initial jobs if you reconfigure the model or a change the configuration tables.

CAUTION! When you rerun the initial jobs, the Stage library and solution data layer tables are re-created, and you might lose the data.

You can access the initial jobs at the following location in SAS Data Integration Studio: `/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave01 (Initial One Time)`

The following table explains the initial jobs in detail. You must run the initial jobs in the sequence in which they appear in the table.

Table 7.2 *Initial Jobs*

Job Name	Job Description	Required Inputs
faw_0101_generate_datamart	Creates the table structures in the following data marts: ■ stage ■ solution data layer (SDL) ■ control library	Information that you entered into the configuration tables.
faw_0102_load_time_dim	Creates the Gregorian calendar for collaboration planning in the following SDL tables: ■ TIME_DIM_GREGORIAN ■ TIME_PERIOD_ASSOC_GREGORIAN ■ TIME_PERIOD_GREGORIAN The Gregorian calendar is created with two hierarchies: ■ all time hierarchies except week (such as, day, month, quarter, year) ■ time hierarchies including week (such as day and week) In addition to the time dimension tables, the job also creates the following tables in the CONFIG library: ■ time_dim_hierarchy ■ time_dim_hierarchy_lvl You must edit the time_dim_hierarchy and time_dim_hierarchy_lvl tables with the information that meets your business requirement. For more information about these tables, see Chapter 8, “SAS Forecast Analyst Workbench Configuration Tables,” on page 75.	When you are generating the Gregorian calendar, the following configuration parameters are required: ■ GL_CAL_NO_OF_YRS ■ GL_CAL_YR_START_DT For more information about the configuration parameters, see “Configuring SAS Forecast Analyst Workbench Parameters” on page 34.

Job Name	Job Description	Required Inputs
faw_0103_load_application_config_tables	Creates the UIART tables.	Information mentioned in the configuration tables

Note: After you execute the initial one-time jobs, you can load the data into the stage area.

Loading Data into the Stage Area

Overview of the Stage Area

The stage area is the input data layer for SAS Forecast Analyst Workbench. The table structures for the stage area are created from the following information that you specified in the configuration tables:

- the dimensions that you want to use
- the hierarchy levels for each dimension
- dimension attributes
- key performance indicators (KPIs)

SAS Forecast Analyst Workbench contains five core dimensions and two dimensions that you can customize to meet your business requirements. Select **Yes** for the valid flag in the DIM_TABLE_LIST configuration table to use a dimension. You do not need to use all the dimensions. SAS Forecast Analyst Workbench contains the following core dimensions:

- Product
- Store Location
- Customer
- Employee
- Organization

SAS Forecast Analyst Workbench contains the following two dimensions that you can customize to meet your business requirements:

- Custom1
- Custom2

Note: If you select the STORE_LOCATION and PRODUCT dimensions, SAS Forecast Analyst Workbench creates additional columns that are specific to these dimensions.

Note: Based on the dimension that you select, the dimension tables and its dependent tables are created. For example, if you select the PRODUCT dimension, all dependent tables (such as BOM) are created.

You can specify the number of KPIs that you require and the number of dimensions that are required for each KPI. For example, you can specify to use two KPIs (such as demand and sales) and the number of dimensions that are

dependent on these two KPIs. The table structure is created by obtaining data from the KPI_CONFIG configuration table.

You can map the stage tables to the data in the source system. The Stage tables ensure that the source data is correctly imported into the format that is required for the tables in SAS Forecast Analyst Workbench.

When you are loading data to the Stage tables, consider the following points:

- Ensure that you maintain the case of the data because the data is case sensitive. For example, suppose you load **`Projector XYZ`**. You must enter **`Projector XYZ`** every time you load data for Projector XYZ. If you change the case, SAS Forecast Analyst Workbench treats that record as another record. For example, suppose you enter **`projector XYZ`**. The value **`projector XYZ`** is treated as another record when Projector XYZ is already loaded.
- Ensure that children roll up into a unique parent member.
- Ensure that the combination of the name and ID fields are unique and are not changed during consecutive loads.
- Ensure that values are provided for the highest and lowest hierarchy levels.
- Ensure that the combination of the time and dimension member values are unique. The fact data within the same table has to be summarized.

Structure of the Dimension Tables

The following table provides an example of the columns that are created in the Dimension table in the stage area. The name for the Dimension table is fixed, and SAS Forecast Analyst Workbench matches the value in the DIM_NM column of the CONFIG.DIM_TABLE_LIST table. For example, for the PRODUCT dimension, the table name is PRODUCT.

Note: In the actual column names, **`<DIMENSION>`** is replaced by the name of the dimension that you selected. For example, if you select the PRODUCT dimension, the column names are PRODUCT_ID, and so on.

Table 7.3 *Structure of the Dimension Table*

Column Name	Data Type	Mandatory?	Description
`<DIMENSION>`_ID	Char	Y	Alphanumeric column where the business key identifier of the dimension is stored. This value must be unique.
`<DIMENSION>`_NM	Char	Y	Value that appears at the leaf-level node of the dimension.
`<DIMENSION>`_DESC	Char	N	Description of the leaf-level node of the dimension.
LANGUAGE_CD	Char	N	Language code that is applicable for the solution. You must use the same language code that you declared in the configuration parameters. This column is required for SAS Financial Management.

Column Name	Data Type	Mandatory?	Description
<DIMENSION>_LVL_IDn	Char	Y	Alphanumeric identifier for the nth level of the dimension. The LVL_ID value holds the IDs for the members at the most aggregate level in the hierarchy. The levels with higher ID numbers are the more detailed levels.
<DIMENSION>_LVL_NMn	Char	Y	Name of the nth level of the dimension.
<DIMENSION>_LVL_DESCn	Char	N	Description of the nth level of the dimension.
<DIMENSION>_ATTRIBn	Char	Y	Various attribute values for the dimension.
VALID_FROM_DTTM	Datetime	Y	The datetime stamp details for the period from which this record is effective in the warehouse. The time value is set to the period when the record is loaded into the warehouse. The time value must be rounded to full seconds. This column is a versioning instrument. Only one record is valid at any given time. If the value for the time is not available, set it to 00:00:00:00.
VALID_TO_DTTM	Datetime	Y	The datetime stamp details for the period until which this record is effective in the warehouse. The time value is set to 1 second before the time of the period that the next record with the same key is effective. The time value must be rounded to full seconds. If the value for the time is not available, set it to 23:59:59:00.
PROCESSED_DTTM	Datetime	N	The datetime stamp details for when the record was loaded in the warehouse. In the case of updates that do not version the row, such as error correction and data patching, the column records the datetime stamp for the update.

Table Dependency

You can load the stage tables in the sequence shown in the following table to ensure that all the table dependencies are met.

The table provides an example for the following scenario:

- all seven dimensions are used in the implementation
- there is only one fact table, KPI_DEMAND

You can use the same loading sequence that is shown in the following table if you have more than one fact table.

Table 7.4 Table Dependency

Table Name	Loading Sequence Group
CUSTOM1	1
CUSTOM2	1
CUSTOMER	1
EMPLOYEE	1
ORGANIZATION	1
PRODUCT	1
STORE_LOCATION	1
BOM	2
PRODUCT_SPEC	2
KPI_DEMAND	2
PHASE_IN_PHASE_OUT_DTLS	2
SUCCESSOR_RLTN_DTLS	3

The sequence consists of groups that are specified in the Loading Sequence Group column in the above table. You can load the tables that belong to a group simultaneously or in any order. However, you must load all the tables of a group before you load tables from the next group.

Running Ongoing Jobs

Whenever the customer data is populated and refreshed in the stage library, you must run the ongoing jobs. By running the ongoing jobs, the data is loaded from the stage library into SDL tables, and then into UIART. The ongoing jobs are located in the SAS Data Integration Studio at the following locations:

- `/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave02`
- `/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave03`

The following table explains the jobs that are present in `Wave02` and `Wave03`.

Job Name	Job Description	Required Input
faw_0201_load_stage_to_sdl	Loads the data from the stage area to the following tables: ■ dimension tables ■ alternate hierarchy tables ■ fact tables ■ independent variable tables ■ bill of material table ■ product specifications table	faw_0101_generate_data mart and customer data that is loaded into the stage tables.
faw_0301_load_uiart_input_tables	Loads the UIART.	Wave01 and Wave02 jobs
faw_0302_load_attributes	Loads the following attribute tables into the UIART library: ■ ATTRIBUTE_LIST ■ ATTRIBUTE_VALUES ■ NODE_ATTRIBUTES	faw_0301_load_uiart_input_tables
faw_0303_load_event_table	Loads the plan_create_event table into the UIART library.	faw_0301_load_uiart_input_tables

Job Name	Job Description	Required Input
faw_0304_execute_auto_detect_train	Creates the following tables in the CONFIG library, and then generates the score analysis for all products: ■ DIM_ATTRB ■ INDEP_MEAN_STAT ■ KPI_INDEP ■ KPI_DIMENSION_PARENT_LVL ■ TRAIN_PARAM<n> If the above tables are already present, SAS Forecast Analyst Workbench uses the data that is present in the tables to generate the scores for all products. The score analysis is used to generate the forecast values for newly phased in relationships of all products. SAS Forecast Analyst Workbench generates the score analysis in the following directory: **SAS-Configuration-directory\Levn\AppData\SASForecastAnalystWorkbench\data\abt**. You might receive an error related to insufficient memory while you are running this job. For more information about allocating sufficient memory, see "Allocate Memory for Generating Forecasts Automatically" on page 52.	The information that is entered into the CONFIG.KPI_CONFIG table.

Authorizing Users to Access Data

After you run the initial jobs and the ongoing jobs, you must provide users with access to the solution data. Whenever you add a new user or new dimensional data to the solution and then the ongoing jobs are run, you need to provide users with access to the newly added data.

You use SAS Management Console to authorize users' access the data. For more information about authorizing users to access data, see "Authorizing Users to Access Data" on page 41.

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SAS Forecast Analyst Workbench Configuration Tables

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Overview of the Configuration Tables

The following configuration tables are created after you run the configuration jobs. You must edit the configuration tables to meet your business requirements. The initial one-time jobs use the information that is in these tables to create the stage tables.

CREATE_EVENT

The CREATE_EVENT table stores information related to events. You can create events in any of the following ways:

- create events in SAS Forecast Studio, and then promote them in SAS Forecast Analyst Workbench using the promote functionality. To create and promote the events:

  1 Create a forecast.

  2 Create a modeling project for that forecast.

  3 Open the modeling project in SAS Forecast Studio.

  4 Create events in the modeling project.

  5 Refresh the modeling project in the Modeling category.

  6 Promote the modeling project in the Modeling category.

  These types of events are automatically appended to this table.
- create events by using the HPFEVENTS procedure, and then manually append them to the table.
- create events in a .csv file and import that file into SAS Forecast Analyst Workbench. For details about importing an event by using a .csv file, see *SAS Forecast Analyst Workbench: User's Guide*.

Note: You should not delete any events from the table because they might have been used in forecasts.

Before you add events to the CREATE_EVENT configuration table, see *SAS Forecast Server Procedures: User's Guide*.

DIM_ATTRB

The DIM_ATTRB table describes the use of common and product-specific attributes for the Product dimension. These attributes are used when scores are generated for products. The table is generated with the default values. However, you can update the USE_IND column of the table to meet your business requirements.

Table 8.1 Description of the DIM_ATTRB Table

Column Name	Description	Data Type	Editable?	Sample Value
DIM_RK	Unique surrogate key for a dimension. This is a foreign key obtained from the DIM_TABLE_LIST table in the configuration library.	Number	No	1
ATTRIB_RK	Unique surrogate key for the attribute.	Number	No	1
ATTRIB_NM	Name of the attribute. The attribute can be a common attribute or a product-specific attribute.	Char (40)	No	Contribution Level
COMMON_ATTRIB_IND	Indicates whether the attribute is a common attribute. The value `1` indicates that the attribute is a common attribute. The value `0` indicates that the attribute is a product-specific attribute.	Number	No	1
USE_IND	Indicates whether to use the attribute for generating the scores for products. The value `1` indicates to use the attribute for generating the scores. The value `0` indicates not to use the attribute for generating the scores.	Number	Yes	1
ATTRIB_VAR_NM	This column is for internal use. Do not change the value of this column.	Char (40)	No	Spec1_1

DIM_HIERARCHY

The DIM_HIERARCHY table is used to define the alternate hierarchy for a dimension during configuration. After the alternate hierarchy for a dimension is defined, the planner can use that alternate hierarchy to create the plans and can then perform collaboration planning. You must use DIM_HIERARCHY table along with the information that is defined in the DIM_HIERARCHY_LVL table.

If you want to add an alternate hierarchy after you have started to use SAS Financial Management, see Chapter 13, “Adding an Alternate Hierarchy for Collaboration,” on page 143.

Table 8.2 *Description of the DIM_HIERARCHY Table*

Column Name	Description	Data Type	Editable?	Sample Value
HIERARCHY_RK	Unique surrogate key for the hierarchy.	Number	Yes	1
DIM_RK	Unique surrogate key for a dimension. This is a foreign key obtained from DIM_TABLE_LIST table in the configuration library.	Number	Yes	1
HIERARCHY_CD	Unique code of the hierarchy.	Char (10)	Yes	BRAND
HIERARCHY_DESC	Description of the hierarchy.	Char (255)	Yes	Product Brand
HIERARCHY_DISPLAY_NM	Display name of the hierarchy. The name is displayed on the user interface while a user selects the alternate hierarchy in the plan.	Char (40)	Yes	Product Brand
HIER_LVL_CNT	Number of levels in the hierarchy.	Number	Yes	5

DIM_HIERARCHY_LVL

The DIM_HIERARCHY_LVL table defines the hierarchy levels for the alternate hierarchies for a dimension. This table is required when an alternate hierarchy is defined for collaboration planning in the DIM_HIERARCHY table.

Table 8.3 *Description of DIM_HIERARCHY_LVL Table*

Column Name	Description	Data Type	Editable?	Sample Value
HIERARCHY_RK	Unique surrogate key for a hierarchy. This is a foreign key obtained from DIM_HIERARCHY table.	Number	No	1
DIM_RK	Unique key for the dimension. This is a foreign key obtained from DIM_HIERARCHY table.	Number	No	1
TABLE_NM	Name of the hierarchy table. The table name is created in the following format: <DIM_NM>_<HIERARCHY_CD>.	Char (32)	No	PRODUCT_BRAND
VARIABLE_NM	Name of the hierarchy level column.	Char (32)	No	PRODUCT_LVL_NM1
HIER_ORDER_NO	The order of the hierarchy column.	Number	No	1
LEAF_NODE_IND	Leaf-node indicator. The value `0` indicates that the node is not a leaf node. The value `1` indicates that the node is a leaf node.	Number	No	0
DISPLAY_NM	Display name of the hierarchy level.	Char (40)	Yes	All Product Brands

DIM_TABLE_LIST

The DIM_TABLE_LIST table is created with default values after you run the ETL jobs. Keep the following information in mind when you enter information in the columns that are editable:

- the valid dimensions for the configuration
- the dimension display name
- the hierarchy levels that the dimension should contain
- the common attributes that the dimension supports
- the valid language code
- the description of the dimension

The DIM_TABLE_LIST table is used to create the dynamic data model. The number of dimension tables and the columns within those tables is determined by the content of this table.

Table 8.4 *Description of the DIM_TABLE_LIST Table*

Column Name	Description	Data Type	Editable?	Sample Value
DIM_RK	Unique serial number of the dimension.	Number	No	1
DIM_ID	Unique identifier for the dimension.	Char (32)	No	PRODUCT_ID
DIM_NM	Unique name for the dimension.	Char (32)	No	PRODUCT
DIM_ADK	Additional description key column name for the dimension. This column is required in order to integrate SAS Forecast Analyst Workbench with SAS Financial Management.	Char (32)	No	PRODUCT
PRIMARY_RK_NM	Unique name of the retained key column of the dimension.	Char (40)	No	PRODUCT_RK
VALID_DIM_FLG	Flag that indicates whether the dimension is applicable. Valid values are `Y` or `N`. These values must be in sync with the value that is specified in the configuration parameter for short names, GL_SHORT_YES, or GL_SHORT_NO.	Char (3)	Yes	Y

Column Name	Description	Data Type	Editable?	Sample Value
DIM_DESC	Description of the dimension. This column is optional.	Char (255)	Yes	Information about all items that include finished goods, assemblies, subassemblies, and parts.
DIM_DISPLAY_NM	The display name of the dimension. This name is shown on the user interface of SAS Forecast Analyst Workbench.	Char (40)	Yes	ITEM
HIERARCHY_CD	Unique identifier for the hierarchy.	Char (10)	No	DEFAULT
HIERARCHY_DISPLAY_NM	Display name of a hierarchy. The display name that you enter is shown on the user interface.	Char (40)	Yes	Default
HIER_LVL_NO	Number of hierarchy levels that are required for the dimension. If the dimension does not have any hierarchy levels, you must enter `1` in order to create a single hierarchy level for that dimension. The value that you specify in this column determines the number of hierarchy levels that are created in the dimension table.	Number	Yes	6
COMMON_ATTRIB_NO	Number of attributes that are required for the dimensions. If attributes are not required, enter `0`. The value that you specify in this column determines the number of attributes that are created in the dimension table.	Number	Yes	6

Column Name	Description	Data Type	Editable?	Sample Value
QUANTITATIVE_DIM_IND	Indicates whether the dimension is a quantitative dimension or a regular dimension. The value `1` indicates that the respective dimension is a quantitative dimension. The value `0` indicates that the dimension is a regular dimension. **Note:** In order to use a dimension as a quantitative dimension, you also need to set PRODUCT_SUCC_IND to `0` and ensure that the dimension is not a part of any KPI in the CONFIG.KPI_CONFIG table. For more information about using an additional dimension, see Chapter 15, “Adding a Dimension to an Existing Plan,” on page 147.	Number	Yes	1
PROD_SUCC_IND	Indicates whether the dimension is valid for defining a phase-in relationship in the Administration workspace on the user interface. The value `1` indicates that the dimension is shown on the user interface to define the phase-in relationship. The value `0` indicates that the dimension is not shown on the user interface to define the phase-in relationship. If you change the value of the PROD_SUCC_IND column after you have started using SAS Forecast Analyst Workbench, run the ongoing jobs. For more information about running ongoing jobs, see “Running Ongoing Jobs” on page 71.	Number	Yes	1
ORDER_DIM	The order in which the dimensions are displayed on the user interface while a user is adding relationships in the Administration workspace.	Number	Yes	1

Column Name	Description	Data Type	Editable?	Sample Value
LANGUAGE_CD	Required language codes. If you have purchased the license for performing collaboration planning, the value that you enter in this column must match the value that is in the SAS Financial Management Language Code table. Otherwise, you can leave this column blank.	Char (10)	Yes	en

The following table is an example of the DIM_TABLE_LIST table, with important columns.

Table 8.5 *Example of the DIM_TABLE_LIST Table*

DIM_RK	DIM_NM	VALID_DIM_FLG	DIM_DISP_NM	HIERARCHY_CD	HIERARCHY_DISPLAY_NM	HIER_LVL_NO	COMMON_ATTRIB_NO	PROD_SUC_IND	ORDER_DIM	LANGUAGE_CD
1	PRODUCT	Y	PRODUCT	DEFAULT	Default	6	6	1	1	en
2	STORE_LOCATION	Y	STORE_LOCATION	DEFAULT	Default	5	1	1	2	en
3	CUSTOMER	Y	CUSTOMER	DEFAULT	Default	1	1	1	3	en
4	EMPLOYEE	Y	EMPLOYEE	DEFAULT	Default	4	0	1	4	en
5	ORGANIZATION	Y	ORGANIZATION	DEFAULT	Default	4	1	1	5	en
6	CUSTOM1	Y	CUSTOM1	DEFAULT	Default	3	0	1	6	en
7	CUSTOM2	Y	CUSTOM2	DEFAULT	Default	4	2	1	7	en

DIM_VAR_DISP_LIST

The DIM_VAR_DISP_LIST table stores information about the relation between the physical column name and the display name. You can use your business terminology for the display names.

SAS Forecast Analyst Workbench displays all the labels that are configured in this table while you are creating a forecast in the user interface.

Table 8.6 *Description of the DIM_VAR_DISP_LIST Table*

Column Name	Description	Data Type	Editable?	Sample Value
DIM_RK	Unique serial number of the dimension.	Number	No	1
DIM_NM	Unique name for the dimension.	Char (40)	No	PRODUCT
DIM_ID	Unique identifier for the dimension.	Char (32)	No	PRODUCT_ID
LVL_ATTRIB_IND	Indicates whether the variable is a hierarchy level or an attribute. Enter `1` to indicate that the variable is a hierarchy level. Enter `0` to indicate that the variable is an attribute.	Number	No	1
HIER_ORDER_NO	Specifies the order of the hierarchy level for the variable of the dimension.	Number	No	1
LEAF_NODE_IND	Indicates whether the variable of the dimension is a leaf-level node for the hierarchy level columns.	Number	No	0
VARIABLE_NM	Name of the attribute or hierarchy level of the dimensions. This value is the column name of the dimension table.	Char (40)	No	PRODUCT_LVL_NM_1
VARIABLE_DESC	Description of the variable attributes or of the dimension level. This column is optional.	Char (255)	Yes	Stores the first level of the product hierarchy
DISPLAY_NM	Stores the names of the attributes and hierarchy columns of the dimensions. This name is displayed on the user interface. This column is mandatory. By default, this value is the same as the variable name. You must update the values to meet your business requirements.	Char (40)	Yes	ALL PRODUCTS
ATTRIB_DATATYPE	Indicates the type of data that is in this column if this variable is an attribute. Enter `0` to indicate that the data type is character, `1` to indicate that the data type is an integer, `2` to indicate that it is a double, and `3` to indicate that the data type is a date.	Number	Yes	1

Column Name	Description	Data Type	Editable?	Sample Value
ATTRIB_UOM_CD	The unit of measurement code for the attribute. This column is optional.	Char (10)	Yes	DZ – Dozen

The following table shows an example of the DIM_VAR_DISP_LIST table, with important columns.

Table 8.7 *Example of the DIM_VAR_DISP_LIST Table*

DIM_RK	DIM_NM	LVL_ATTRIB_IND	HIER_ORDER_NO	LEAF_NODE_ID	VARIABLE_NM	DISPLAY_NM
1	PRODUCT	1	1	0	PRODUCT_LVL_NM_1	ALL
1	PRODUCT	1	2	0	PRODUCT_LVL_NM_2	SEGMENT
1	PRODUCT	1	3	0	PRODUCT_LVL_NM_3	CLASS
1	PRODUCT	1	4	0	PRODUCT_LVL_NM_4	CATEGORY
1	PRODUCT	1	5	0	PRODUCT_LVL_NM_5	SUBCATEGORY
1	PRODUCT	1	6	1	PRODUCT_NM	PRODUCT NAME
1	PRODUCT	0			PRODUCT_ATTRIB1	ASSEMBLY FLAG
1	PRODUCT	0			PRODUCT_ATTRIB2	MAKE OR BUY
1	PRODUCT	0			PRODUCT_ATTRIB3	MANUFACTURING SOURCE
1	PRODUCT	0			PRODUCT_ATTRIB4	PLANNER
1	PRODUCT	0			PRODUCT_ATTRIB5	CONTRIBUTION LEVEL
1	PRODUCT	0			PRODUCT_ATTRIB6	LIFE CYCLE STAGE

EVENT_REQUIRED

The EVENT_REQUIRED table is related to the CREATE_EVENT table in the configuration library. For each event in the CREATE_EVENT table, a row is present in this table. The row contains the name of the event and an indicator of how the event is included in the model. For example, you can force an event to be used, or you can use the event when it is significant to the model.

You can create the EVENT_REQUIRED table in one of the following ways:

- create events in SAS Forecast Studio, and then promote them in SAS Forecast Analyst Workbench

  For more information about CREATE_EVENT table, see "CREATE_EVENT" on page 76.

- create events by using the HPFEVENTS procedure, and then manually add the event names and an indicator for how the event is used in the model in EVENT_REQUIRED table

- create events in a .csv file and import that file into SAS Forecast Analyst Workbench.

  For more information, see *SAS Forecast Analyst Workbench: User's Guide*.

Table 8.8 *Description of the EVENT_REQUIRED Table*

Column Name	Description	Data Type	Editable?	Sample Value
NAME	Name of the event.	Char (40)	Yes If a new event is created in the CREATE_EVENT table, you should add that event name to this table.	Event1

Column Name	Description	Data Type	Editable?	Sample Value
REQUIRED	Indicates how the event is included in the model. The following values are permitted: ■ **YES**: Specifies that the events be included in the model as long as the model does not fail diagnosis. ■ **MAYBE**: Specifies that the events be included in the model as long as the parameters of the events are significant. ■ **NO**: Specifies that the events be included in the model as long as the parameters of the events are significant and the increment in the value of criterion exceeds a threshold. The default value is **NO**.	Char (32)	Yes If a new event is created in the CREATE_EVENT table, you should add an indication of how to use that event in the model in this table.	MAYBE

FORECAST_INTERVAL

The FORECAST_INTERVAL table stores the default values of parameters that are related to forecast intervals (for example, **DAY**, **WEEK**, **MONTH**, and **QUARTER**).

You can add forecast intervals other than the default intervals by adding rows to this table. SAS Forecast Analyst Workbench supports the forecast intervals (except the intervals having granularity less than day) that are supported by SAS Forecast Studio. For more information about forecast intervals, see *SAS Forecast Studio 14.2: User's Guide*.

These intervals are displayed in the user interface and are used in the forecasting process.

Table 8.9 *Description of the FORECAST_INTERVAL Table*

Column Name	Description	Data Type	Editable?	Sample Value
FORECAST_INTERVAL_CD	Forecast interval code. This value must be same as the SAS interval.	Char (20)	No	DAY
FORECAST_INTERVAL_DESC	Forecast interval description that is displayed on the user interface.	Char (40)	Yes	DAY

Column Name	Description	Data Type	Editable?	Sample Value
HORIZON	Default value for the number of periods to be forecasted. The horizon value is shown in the user interface while you are creating a forecast, and you can modify it.	Number	Yes	12
HISTORY_PERIOD	Default value for the number of historical periods to be used in the forecasting process. The horizon period is shown in the user interface while you are creating a forecast, and you can modify it. If a time series contains more than this number of periods, the earlier periods are ignored.	Number	Yes	1095
LOW_HISTORY_THRESHOLD	Least number of periods of historical data that the forecasting process requires in order to generate a statistical forecast. The value of this column cannot be changed through user interface. It is always set to `1`.	Number	Yes	1
ACT_LIKE_THRESHOLD	Minimum periods of historical data required to generate the surrogate forecast automatically. This value cannot be zero.	Number	Yes	30
MINOBS_SEASON	Minimum number of observations that are required in order to perform seasonal adjustments to the demand forecast for the new product. If you edit this column, the values that you provide should be greater than the default values.	Number	Yes	14
SAS_INTERVAL	Time period interval that the SAS Forecast Studio and Econometric time series supports.	Char (20)	Yes	DAY
SEASONALITY	The seasonality cycle length for the time series.	Number	Yes	7

The following table provides an example of the FORECAST_INTERVAL configuration table.

Table 8.10 *Example of FORECAST_INTERVAL Table*

FORECAST_INTERVAL_CD	FORECAST_INTERVAL_DESC	HORIZON	HIESTORY_PERIOD	LOW_HISTORY_THRESHOLD	ACT_LIKE_THRESHOLD	MINOBS_SEASON	SAS_INTERVAL	SEASONALITY
DAY	Day	12	1095	1	30	14	DAY	7
WEEK	Week	12	156	1	12	104	WEEK	52
WEEKV	ISO 8601 week	12	156	1	12	104	WEEKV	52
TENDAY	Ten-day	12	110	1	12	104	TENDAY	52
SEMIMONTH	Semimonth	12	156	1	12	104	SEMIMONTH	52
MONTH	Month	12	36	1	6	24	MONTH	12
QTR	Quarter	12	12	1	2	8	QTR	4
YEAR	Year	12	3	1	1	2	YEAR	1

HPF_PREFERENCES

The HPF_PREFERENCES table contains a list of options for the high-performance forecasting procedures, with default values. You can reset the default values by specifying the values in the HPF_PREFERENCES configuration table. If you change a parameter in the HPF_PREFERENCES configuration table, all forecasts are created with the updated parameter values.

When you create a forecast, SAS Forecast Analyst Workbench uses the HPF_PREFERENCES table to create a HPF_PREFERENCES<`plan_ID`> table in the configuration library. If you change any parameter in the HPF_PREFERENCES<`plan_ID`> table, the values are applied only to the forecast that you have specified. The plan_ID value is the unique identifier of the forecast and appears in the UIART.PLAN_DETAILS table.

The following table describes the HPF_PREFERENCES table and its columns.

Table 8.11 *Description of the HPF_PREFERENCES Table*

Column Name	Description	Data Type	Editable?
OPTION	Unique keyword for each HPF option.	Char (40)	No
VALUE	Value of the HPF option.	Char (40)	Yes

The following table contains the parameters that are in the HPF_PREFERENCES table. If the EDIT_FROM column in the HPF_PREFERENCE_<`PLAN_ID`> table contains `BACK` for a parameter, you can

edit the value of that parameter. You cannot edit the value of a parameter for which the EDIT_FROM column contains `UI`.

The following table provides a list of parameters that are in the HPF_PREFERENCES table and their default value in the HPF_PREFERENCES table.

Table 8.12 *Parameters for the Value Column*

Parameter Name	Description	Default Value
BASENAME	Prefixes any generated XML specification filename if there are no other contextual base name options.	Diag
SIGMAS	Specifies the prediction standard error for the external model.	3
DIAG_ARIMAX_PERROR1	Specifies the start value of the range of the AR order for obtaining the error series.	5
DIAG_ARIMAX_PERROR2	Specifies the end value of the range of the AR order for obtaining the error series.	10
DIAG_DELAY_LAG_EVENT	Indicates whether the delay lag for the event is present. The value `1` indicates that the delay lag for the event is present. The value `0` indicates that the delay lag for the event is not present.	0
DIAG_DELAY_LAG_INPUT	Indicates whether the delay lag for input is present. The value `1` indicates that the delay lag for input is present. The value `0` indicates that the delay lag for input is not present.	0
DIAG_DELAYEVENT	Specifies the delay lag for the events. If this option is not specified, the delay lag for the events is set to `0` by default.	0
DIAG_DELAYINPUT	Specifies the delay lag for the inputs. If this option is not specified, the procedure chooses the delay lag for the inputs.	0
DIAG_ENTRYPCT	Specifies a threshold at which to check the percentage increment of the criterion between two candidate models. The value should be in the range (0,100).	0.1
DIAG_ERROR_SEVERITY	Specifies the severity level of error to be printed. You can specify one of the following values: **`LOW`**, **`MEDIUM`**, **`HIGH`**, **`ALL`**, or **`NONE`**.	ALL
DIAG_ERROR_STAGE	Specifies the stage of the procedure at which an error message needs to be printed. You can specify one of the following values: **`PROCEDURELEVEL`**, **`DATAPREP`**, **`DIAGNOSE`**, or **`ALL`**.	All
DIAG_INCLUDE_IDM	Indicates whether the IDM statement needs to be included.	YES

Parameter Name	Description	Default Value
DIAG_INPUT_SETMISSSING	Specifies how missing values (actual or accumulated) are assigned in the accumulated time series for variables that are listed in the INPUT statement. You can specify one of the following values: **MISSING**, **AVERAGE** | **AVG**, **MINIMUM** | **MIN**, **MEDIAN** | **MED**, **MAXIMUM** | **MAX**, **FIRST**, **LAST**, **PREVIOUS** | **PREP**, or **NEXT**.	MISSING
DIAG_INPUT_TRIMMISS	Specifies how missing values (actual or accumulated) are trimmed from the accumulated time series for variables that are listed in the INPUT statement. You can specify one of the following values: **NONE**, **LEFT**, **RIGHT**, or **BOTH**.	NONE
DIAG_INPUT_ZEROMISS	Specifies how beginning and ending zero values (actual or accumulated) are interpreted in the accumulated time series for variables that are listed in the INPUT statement. You can specify one of the following values: **NONE**, **LEFT**, **RIGHT**, or **BOTH**.	NONE
DIAG_INPUTMISSING_PCT	Specifies the size of the missing observation as a percentage of the length of the input time series. If INPUTMISSINGPCT=50, an input time series that has more than 50% missing data is ignored in the model.	10
DIAG_TREND_P	Specifies the autoregressive order for the augmented unit root tests and a seasonality test.	min(5,[T/10])
DIAG_TREND_SIGLEVEL	Specifies the significance level to use as a cutoff value for deciding whether the series needs differencing.	0.01
HPF_ALPHA	Specifies the confidence level size to use in computing the confidence limits in the model selection list files.	0.05
HPF_BACK	Specifies the number of observations that are excluded before the end of the data while the forecast is being generated (out of sample).	0
HPF_DIAGNOSE_INTERMITTENT	Specifies a number greater than 1 that is used to determine whether a time series is intermittent	2
HPF_FCST_ACCUMULATE	Specifies how the data set observations are accumulated within each time period for the variables that are listed in the FORECAST statement. You can specify one of the following values: **NONE**, **TOTAL**, **AVERAGE** | **AVG**, **MINIMUM** | **MIN**, **MEDIAN** | **MED**, **MAXIMUM** | **MAX**, **N**, **NMISS**, **NOBS**, **FIRST**, **LAST**, **STDDEV** | **STD**, **CSS**, or **USS**.	NONE
HPF_FCST_SETMISSING	Specifies how missing values (actual or accumulated) are assigned in the accumulated time series for variables that are listed in the FORECAST statement. You can specify either a number or an option. The option accepts one of the following values: **MISSING**, **AVERAGE** | **AVG**, **MINIMUM** | **MIN**, **MEDIAN** | **MED**, **MAXIMUM** | **MAX**, **FIRST**, **LAST**, **PREVIOUS** | **PREP**, or **NEXT**.	MISSING

Parameter Name	Description	Default Value
HPF_FCST_TRIMMISS	Specifies how missing values (actual or accumulated) are trimmed from the accumulated time series for variables that are listed in the FORECAST statement. You can specify one of the following values: **NONE**, **LEFT**, **RIGHT**, or **BOTH**.	NONE
HPF_FCST_ZEROMISS	Specifies how beginning zero values, ending zero values, or both (actual or accumulated) are interpreted in the accumulated time series for variables that are listed in the FORECAST statement. You can specify one of the following values: **NONE**, **LEFT**, **RIGHT**, or **BOTH**.	NONE
HPF_ID_ACCUMULATE	Specifies how the data set observations are accumulated within each time period. You can specify one of the following values: **NONE**, **TOTAL**, **AVERAGE** | **AVG**, **MINIMUM** | **MIN**, **MEDIAN** | **MED**, **MAXIMUM** | **MAX**, **N**, **NMISS**, **NOBS**, **FIRST**, **LAST**, **STDDEV** | **STD**, **CSS**, or **USS**.	NONE
HPF_ID_ALIGN	Controls the alignment of SAS dates that are used to identify output observations. You can specify one of the following values: **BEGINNING** | **BEG** | **B**, **MIDDLE** | **MID** | **M**, or **ENDING** | **END** | **E**.	BEGINNING
HPF_ID_SETMISSING	Specifies how missing values (actual or accumulated) are assigned in the accumulated time series. You can specify either a number or an option. The option accepts one of the following values: **MISSING**, **AVERAGE** | **AVG**, **MINIMUM** | **MIN**, **MEDIAN** | **MED**, **MAXIMUM** | **MAX**, **FIRST**, **LAST**, **PREVIOUS** | **PREP**, or **NEXT**.	MISSING
HPF_ID_TRIMMISS	Specifies how missing values (actual or accumulated) are trimmed from the accumulated time series. You can specify one of the following values: **NONE**, **LEFT**, **RIGHT**, or **BOTH**.	NONE
HPF_ID_ZEROMISS	Specifies how beginning zero values, ending zero values, or both (actual or accumulated) are interpreted in the accumulated time series. You can specify one of the following values: **NONE**, **LEFT**, **RIGHT**, or **BOTH**.	NONE
DIAG_INPUT_REQUIRED	Specifies how the input variables be included in the model. You can specify one of the following values: **YES**, **NO**, or **MAYBE**.	NO
DIAG_ARIMAX_METHOD	Specifies the method for choosing the tentative ARMA orders. You can specify one of the following values: **ESACF**, **MINIC**, or **SCAN**.	MINIC
HPFENGINE_INPUT_REQUIRED	Enables a check of inputs to models. The options are **YES** and **NO**. If you set this option to **YES**, these checks are not performed and no inputs are dropped from a model. If you set this option to **NO**, inputs are checked and those with errors or those judged to be collinear are dropped from the model for the current series and task only.	YES

Parameter Name	Description	Default Value
HPFENGINE_INPUTTRIMMISS	Specifies how missing values (either actual or accumulated) are trimmed from the accumulated time series for variables listed in the INPUT statement.	RIGHT
HPF_EXCEPTIONS	Specifies how arithmetic exceptions are handled during the run. The options are **CATCH** and **IGNORE**. The option **IGNORE** specifies that SAS Forecast Analyst Workbench stops on an arithmetic exception. No recovery is attempted. The option **CATCH** specifies that SAS Forecast Analyst Workbench skips the generation of diagnostic output for the variable that produces the exception in the current BY group.	CATCH
DIAG_ARIMAX_OUTLIER_FILTER	Chooses a model for outlier detection. The options are **FULL** and **SUBSET**. If you set the option to **FULL**, use a full model. If you set the option to **SUBSET**, use a subset model that includes non-seasonal AR and MA filters only.	SUBSET
DIAG_HPF_COMPONENTS	The type of the decomposition. The value **INTEGRATE** specifies that the calculated decomposition is of the second type, and the default decomposition is of the first type. In the first type of decomposition, the components in the decomposition always add up, or multiply in the log transformation case, to the series forecasts. In the integrated version of the decomposition, this additive property might not always hold because no natural choices of starting values that guarantee the additivity of the resulting decomposition can be used during the integration of these components.	INTEGRATE
HPF_SELECT_ENDZEROS_MAXNUM	Specifies the maximum number of trailing zero values for a nonzero model.	0
HPF_SELECT_ENDZEROS_MAXPCT	Specifies the maximum percentage of trailing zero values for a nonzero model relative to the number of nonzero values in the entire series.	0
HPF_SELECT_ENDZEROS_MINOBS	Specifies the threshold that is required for the series length to enable the ENDZEROS test.	1

In the HPF_PREFERENCES<**plan_id**> table, in addition to the parameters that are listed in the previous table, the following parameters are created for each independent variable:

- DIAG_INPUT_REQUIRED<**N**>
- DIAG_INPUT_SETMISSING<**N**>
- DIAG_INPUT_TRIMMISS<**N**>
- DIAG_INPPUT_ZEROMISS<**N**>

In these parameters, <**N**> represents the sequence in which the independent variable is selected in the forecast.

INDEP_AGGRE_METHOD

The INDEP_AGGRE_METHOD table contains a list of all aggregation methods that are used to aggregate the independent variables. The list contains all the methods that are described in *SAS Forecast Server Procedures: User's Guide*. Unless a new method is added or changes are made to the existing name of the aggregation method in SAS High-Performance Forecasting, you do not need to modify this table.

Table 8.13 *Description of the INDEP_AGGRE_METHOD Table*

Column Name	Description	Data Type	Editable?	Sample Value
METHOD_RK	Unique number of the aggregation method.	Number	No	2
METHOD_NM	Name of the method.	Number	No	TOTAL

INDEP_MEAN_STAT

The INDEP_MEAN_STAT table contains methods that are used for generating the scores for products. The methods are present in the MEANS procedure. For more information about PROC MEANS, see *Base SAS® 9.4 Procedures Guide* at http://support.sas.com/documentation/cdl/en/proc/68954/PDF/default/proc.pdf.

The information in this table is used by the KPI_INDEP table.

Table 8.14 *Description of the INDEP_MEAN_STAT Table*

Column Name	Description	Data Type	Editable?	Sample Value
METHOD_RK	Unique surrogate key for methods that will be used for generating scores of products.	Number	Yes	1
METHOD_NM	Name of the method.	Char (40)	Yes	MEAN

INDEP_VAR_TABLE

The INDEP_VAR_TABLE table is a configuration table that stores information that is related to the independent variables. After you run the ETL jobs, the table

structure is created. You must enter independent variable information in this table. Each row of the table belongs to an independent variable.

Note: After you include an independent variable listed in this table in a forecast, you can edit the values in the INDEP_VAR_DISPLAY_NM column. If you edit the values of the independent variables after they are used in a forecast, a mismatch in the existing data might occur.

The names in the INDEP_VAR_NM column are used as the column names in the independent variable table that is specific to a key performance indicator (KPI).

Table 8.15 *Description of the INDEP_VAR_TABLE Table*

Column Name	Description	Data Type	Editable?	Sample value
INDEP_VAR_RK	Unique number of the independent variable. This column is mandatory.	Number	No	1
INDEP_VAR_NM	Name of the independent variable. This name must be valid SAS name because it is used as a column name in an independent table. This column is mandatory.	Char (32)	No	Product_Discount
INDEP_VAR_DESC	Short description of the independent variable.	Char (255)	Yes	Discount that our organization wants to give to customers
INDEP_VAR_DISPLAY_NM	Name of the independent variable, which is displayed in the user interface This column is mandatory.	Char (40)	Yes	Product Discount

KPI_CONFIG

The KPI_CONFIG table stores information about the dependent variables. The dependent variables are the key performance indicators (KPIs) to be forecasted by SAS Forecast Analyst Workbench. After you run the ETL jobs, the empty structure is created for KPI_CONFIG table. You can add a row for each KPI. In other words, each row in the table belongs to a KPI. The table also stores information about the independent variables that are associated with the KPI.

Note: After you insert the rows in this table and these values are used in the forecast, do not edit or change the values except for the values in the KPI_AGGRE_METHOD column. If you edit or change the values, a mismatch in the existing data might occur.

Note: You do not need to specify values in the LIB_INDEP, INDEP_TABLE_NM, and INDEP_VAR_LIST columns if none of the independent variables are associated with the configured KPI.

Table 8.16 Description of the KPI_CONFIG Table

Column Name	Description	Data Type	Editable?	Sample Value
KPI_RK	Unique serial number that is associated with the KPI. This column is mandatory.	Number	Yes	1
KPI_NM	Name of the KPI. This column is mandatory.	Char (40)	Yes	DEMAND_KPI
LANGUAGE_CD	The required code for language.	Char (40)	Yes	en
KPI_TYPE	Type of the KPI. This column is mandatory.	Char (32)	Yes	Operational
LIB_NM	Name of the library in which the KPI table that is specified in the KPI_TABLE_NM column is stored. This column is mandatory and it must contain the value **SDL**.	Char (32)	Yes	SDL
KPI_TABLE_NM	Name of the table in which fact data that is associated with the KPI is stored. The table name must be a valid SAS data set name. This column is mandatory.	Char (40)	Yes	DEMAND_KPI
KPI_VAR_NM	Variable name that is associated with the KPI. The variable name must be a valid SAS variable name. For more information about SAS naming conventions, see *SAS Language Reference: Concepts*. This column is mandatory.	Char (40)	Yes	Demand_QTY
KPI_AGGRE_METHOD	Aggregation and accumulation method to be used for the KPI. This method must be a valid method as described in *SAS Forecast Server Procedures: User's Guide*. You can change this method for different forecasts. This column is mandatory.	Char (32)	Yes	Total
SQL_KPI_AGGRE_METHOD	SQL procedure-related to the aggregation method. The values can be **AVG** | **MEAN**, **COUNT** | **FREQ** | **N**, **CSS**, **CV**, **MAX**, **MIN**, **NMISS**, **PRT**, **RANGE**, **STD**, **STD**, **STDERR**, **SUM**, **SUMWGT**, **T**, **USS**, and **VAR**.	Char (32)	Yes	Sum

Column Name	Description	Data Type	Editable?	Sample Value
DECIMAL_ROUND_OFF_VAL	Number of digits after the decimal point to be displayed in the user interface. This column is mandatory.	Number	No	2
DIM<RK>_IND	Indicates whether the dimension with a DIM_RK value equal to <RK> in the DIM_TABLE_LIST configuration table is applicable for this KPI. This column is mandatory.	Number	Yes	1
LIB_INDEP	Name of the library in which independent variable fact data that is associated with the KPI is stored. This is a mandatory column and it must contain the value `SDL`.	Char (32)	Yes	SDL
INDEP_TABLE_NM	Name of the table in which independent variables fact data is stored. The table name must be a valid SAS data set name.	Char (40)	Yes	Demand_kpi_ind_vars
INDEP_VAR_LIST	Specifies the list of the retained keys of the independent variable, separated by commas. This list is displayed in the user interface for the KPI. For more information about the INDEP_VAR_RK column of the INDEP_VAR_TABLE configuration table for the retained key value of the independent variable, see "INDEP_VAR_TABLE" on page 94.	Char (400)	Yes	1,2,5
LANGUAGE_CD	Required language code. If you have purchased the license for performing collaboration planning, the value that you enter in this column must match the value that is in the SAS Financial Management Language Code table. Otherwise, you can leave this column blank.	Char (10)	Yes	en
KPI_ID	Unique identifier for the KPI.	Char (32)	Yes	DEMAND_ID

Column Name	Description	Data Type	Editable?	Sample Value
KPI_ADK	Additional description key column name for the KPI. This column is required in order to integrate SAS Forecast Analyst Workbench with SAS Financial Management.	Char (32)	Yes	DEMAND
KPI_DESC	Description of the KPI. This column is optional.	Char (255)	Yes	Daily demand.
AUTO_DETECT_IND	Indicates whether SAS Forecast Analyst Workbench must generate scores for the KPI. The value 1 indicates that the scores must be generated for the KPI. The value 0 indicates that the scores are not required to be generated for the selected KPI.	Number	Yes	1
ALLOW_NEGATIVE_IND	Indicates whether negative values for the forecast are allowed. The value 1 indicates that a negative value is allowed. The value 0 indicates that a negative value is not allowed. If you set the value of this column to 1 and a negative value occurs, the forecast value is set to 0.	Number	Yes	0

KPI_DIMENSION_PARENT_LVL

The KPI_DIMENSION_PARENT_LVL table determines the use of the parent hierarchical levels of a dimension as attributes. For example, suppose Product_RK is the leaf level of the PRODUCT dimension and the parent level is specified as 2 in this table. In this case, the successive two levels that are above the Product_RK level (Product_LVL_RK5 and Product_LVL_RK4) are used as attributes when the scores are generated.

The hierarchical levels are used as attributes in calculating the scores for products. All hierarchical levels starting at the level above the leaf level up to the specified level are used as inputs when the scores are generated.

Table 8.17 Description of the KPI_DIMENSION_PARENT_LVL Table

Column Name	Description	Data Type	Editable?	Sample Value
KPI_RK	Unique serial number that is associated with the KPI. This column is mandatory.	Number	No	1
KPI_DIM_RK	Unique serial number of the dimension of a KPI.	Number	No	1
PARENT_LVL	The hierarchical level that is to be used as an attribute. The value 0 indicates leaf level of the dimension. The hierarchical number that you enter in this column must match the number of hierarchy levels that are present in the dimension.	Number	Yes	2

KPI_INDEP

The KPI_INDEP table contains information about all independent variables that are present for the selected KPI. You can specify the independent variables that must be used in generating the scores for products by editing the USE_IND column.

Table 8.18 Description of the KPI_INDEP Table

Column Name	Description	Data Type	Editable?	Sample Value
KPI_RK	Unique serial number that is associated with the KPI. This column is mandatory.	Number	No	1
INDEP_RK	Unique serial key of the independent variable.	Number	No	1
INDEP_AGGRE_NO	The aggregation method that is to be used for the independent variable.	Number	Yes	2

Column Name	Description	Data Type	Editable?	Sample Value
INDEP_MEAN_STAT	The method that is to be used for calculating the score of products.	Number	Yes	1
USE_IND	Indicates whether to use the independent variable for generating the scores for products. The value 1 indicates to use the independent variable for generating the scores. The value 0 indicates not to use the independent variable for generating the scores.	Number	Yes	0

NPF_CONFIG

The NPF_CONFIG table stores parameters that are used for forecasting the demand for a new product. These parameters are used in the system coding. After you run the ETL jobs, the default values are populated. You must not edit these values except for the value of the NPF_MODE option. You can change the default value of NPF_MODE from MULT to ADD, if all the candidate time series contain zero values for a given time point.

Table 8.19 *Description of the NPF_CONFIG Table*

Column Name	Description	Data Type	Editable?	Sample Value
PRODUCT_RK	Unique number of a product for which the NPF_OPTION column is applicable. By default, the options are applicable for all products. Therefore, the value of this column should be 0.	Number	No	0
KPI_RK	Serial number that is associated with the KPI. The default value is 0. The value 0 indicates that the record is applicable for all KPIs.	Number	No	0

Column Name	Description	Data Type	Editable?	Sample Value
NPF_OPTION	Option name that is used to forecast the demand for the new product.	Char (40)	No	For more information about the NPF options, see Table 8.20 on page 101.
NPF_VALUE	The option value.	Char (40)	For more information, see Table 8.20 on page 101.	For more information, see Table 8.20 on page 101.

The options for the NPF_OPTION column are described in the following table.

Table 8.20 *Details of the Options for the NPF_OPTION Column*

Option Name	Description	Default Value	Editable?
NPF_MODEL_ALPHA	Significance value for confidence, and prediction intervals and tests.	0.05	No
NPF_DISTANCE_METHOD	Distance method that is used in the clustering of the time series for the candidate product.	EUCLID	No
NPF_CLUSTER_METHOD	Clustering method that is used in the clustering of the time series for the candidate product.	WARD	No
NPF_CLUSTER_SORTLIST	Sorting method that is used in the clustering of the time series for the candidate product.	CLUSTER	No
NPF_QUERY_ACCUMULATE	Accumulation method that is used to compute the cumulative sum of profile series and panel series.	TOTAL	No
NPF_QUERY_TRANSFORM	The method of transformation to be applied to the input series before the interpolating function is fit. SAS Forecast Analyst Workbench uses this method of transformation while it is using EXPAND procedure during the **Select Candidate Products** step to create profile series and panel series.	CUSUM	No
NPF_ESM_MODEL	Forecasting model to be used in the exponential smoothing reduction method.	SIMPLE	No
NPF_NEURAL_HIDDEN	Number of hidden units in the neural network model.	1	No

Option Name	Description	Default Value	Editable?
NPF_MODE	Mode to be used while adjusting the seasonality. You can change the default value to **ADD**.	MULT	Yes

NPF_MODEL_LOOKUP

The NPF_MODEL_LOOKUP table contains a list of models that are used to forecast the demand for a new product. The New Products workspace in SAS Forecast Analyst Workbench supports the Naive and Neural models by default. You can add custom models by specifying the path of the non-compiled model code in the MODEL_PATH column. For naive and neural models, you do not need to include the path in the MODEL_PATH column.

Table 8.21 *Description of the NPF_MODEL_LOOPUP Table*

Column Name	Description	Data Type	Editable?	Sample Value
MODEL_ID	Unique identifier for the model.	Number	No	
MODEL_NM	Name of the model.	Char (40)	No	NAIVE_REG
MODEL_DISPLAY_NM	Name of the model, which is displayed in the user interface.	Char (40)	Yes	NAIVE MODEL
MODEL_PATH	Path where the SAS macro of the custom model is stored. The model path must contain two backslashes, as shown in the Sample Value column. The New Products workspace of the SAS Forecast Analyst Workbench contains two default models for forecasting the new product: naive and neural. In additional to these two models, you can use a custom model by specifying its path in this column. For more information about a custom model, see “Using a Custom Model for New Product Forecasting” on page 158.	Char (255)	Yes	`c:\ \custom_model.sas`

NPF_REDUCTION_METHODS

The NPF_REDUCTION_METHODS table stores the methods that are used in the dimension reduction analysis. The dimension reduction analysis removes the time dependency. The reduced data depends on the time index or the cycle index, but does not depend on time. The reduction methods are used in the **Select Cluster** step in the New Products workspace in the user interface. Currently, the seasonal decomposition method and exponential smoothing methods are supported.

Table 8.22 *Description of the NPF_REDUCTION_METHODS Table*

Column Name	Description	Data Type	Editable?	Sample Value
REDUCTION_METHOD_RK	Unique number of the reduction method.	Number	No	1
REDUCTION_METHOD_NM	Reduction method name. You can edit this value in order to set it according to your locale.	Char (32)	Yes	Decomposition

PLAN_THREAD

The PLAN_THREAD table is used in the forecasting process. Each row in the table contains a forecast ID that is specific to each forecast. Each row also contains the corresponding number of sessions to be spawned by the SAS Stored Process Server for parallel processing. This table is initially populated with default values. The default THREAD_NUM value for each forecast is derived from the GL_FORECAST_THREAD_NO configuration parameter.

Table 8.23 *Description of the PLAN_THREAD Table*

Column Name	Description	Data Type	Editable?	Sample Value
PLAN_ID	Unique identifier for the forecast.	Number	No	2
THREAD_NUM	Number of parallel threads to be spawned.	Number	Yes	1

TIME_DIM_HIERARCHY

The TIME_DIM_HIERARCHY table contains details for the default time dimension and the alternate hierarchy that is generated for the time dimension. The details for the default hierarchy are created by the initial ETL jobs. The details for the alternate hierarchy are created by the utility jobs.

When the Gregorian calendar is created, the following records are added:

- default hierarchy

  The default hierarchy contains the following hierarchy levels: Day, Month, Quarter, and Year. The information about these hierarchy levels (also called base periods) is populated in the TIME_DIM_HIERARCHY_LVL table.

- default week hierarchy

  The default week hierarchy contains the day and week hierarchy levels. The information about these hierarchy levels is populated in the TIME_DIM_HIERARCHY_LVL table.

Table 8.24 *Description of TIME_DIM_HIERARCHY Table*

Column Name	Description	Data Type	Editable?	Sample Value
HIERARCHY_RK	Unique key for the hierarchy.	Number	No	0
DIM_RK	Foreign key obtained from DIM_TABLE_LIST for the hierarchy.	Number	No	0
HIERARCHY_CD	Unique code for the hierarchy.	Char (10)	No	Gregorian
HIERARCHY_DESC	Description of the hierarchy.	Char (255)	No	Gregorian
HIERARCHY_DISPLAY_NM	Display name of the hierarchy.	Char (40)	Yes	Gregorian
HIER_LVL_CNT	Number of levels in the hierarchy.	Number	No	4

TIME_DIM_HIERARCHY_LVL

The TIME_DIM_HIERARCHY_LVL table is generated for the default hierarchy and alternate hierarchies of the time dimension. These hierarchies can be used to perform collaboration planning.

Table 8.25 Description of TIME_DIM_HIERARCHY_LVL Table

Column Name	Description	Data Type	Editable?	Sample Value
HIERARCHY_RK	Unique key for the hierarchy that is obtained from DIM_HIERARCHY table.	Number	No	0
DIM_RK	Unique key for the dimension that is obtained from DIM_HIERARCHY table.	Number	No	0
TABLE_NM	Name of the hierarchy table.	Char (32)	No	time_dim_gregorian
VARIABLE_NM	Name of the hierarchy level.	Char (32)	No	YEAR
HIER_ORDER_NO	Order in the hierarchy level.	Number	No	1
LEAF_NODE_IND	Leaf node indicator. The value `1` indicates that the node is a leaf node. The value `0` indicates that the node is not a leaf node.	Number	No	0
TIME_PERIOD_TYPE_CD	Code of the time period type.	Char (3)	No	YEAR
DISPLAY_NM	Display name of the hierarchy level.	Char (40)	Yes	YEAR
DEFAULT_PAST_PERIODS	Default number of history periods to consider for collaboration planning. The number that you enter for the default past periods is shown in the user interface for the hierarchy level.	Number	Yes	3
DEFAULT_FUTURE_PERIODS	Default number of future periods to consider for collaboration planning. The number that you enter for the default future period is shown in the user interface for the hierarchy level.	Number	Yes	3

TRAIN_PARAM<n>

The TRAIN_PARAM<n> table contains parameters that are used in all associated statistical procedures to generate scores for products. The TRAIN_PARAM<n> table is generated for all KPIs for which the scores are to be generated. The <n> indicates KPI_RK.

If you make any change to the following tables after you run the `\Products \SAS Forecast Analyst Workbench\5.3 Jobs \Wave03\faw_0304_execute_auto_detect_train` job in SAS Data Integration Studio, delete all TRAIN_PARAM<n> tables and rerun the job:

- KPI_INDEP
- DIM_ATTRB
- KPI_DIMENSION_PARENT_LVL

Table 8.26 *Description of the TRAIN_PARAM<n> Table*

Column Name	Description	Data Type	Editable?	Sample Value
PARAM_OPTION	The name of the parameter that is used to generate the scores.	Char (40)		CLUSTER_METHOD
PARAM_VALUE	The value of the parameter that is used to generate the scores.	Char (1200)		Fast

Use the parameters described in the following table to generate the scores.

Table 8.27 *Parameters and Their Description*

Parameter	Parameter Value	Description of the Parameter
INDEX_CYCLE	1	Indicates whether to perform volume clustering or seasonal clustering. The value `1` indicates volume clustering. The value `0` indicates seasonal clustering.
MIN_TS_LENGTH	24	Indicates the minimum length of the time series that are included in the cluster training.
INDEX_NO	24	The number of indexes used for each time series in which seasonal clustering or volume clustering is performed.
DIST	0	Demand pattern metric for clustering. The value `0` indicates Empirical demand distribution. The value `1` indicates Weibull demand distribution. The value `2` indicates to use parameters in Weibull.
ENDDATE	-	The end date of the historical observations.

Parameter	Parameter Value	Description of the Parameter
SEASON_MAXCLUS	20	The maximum number of clusters generated by the FASTCLUS procedure for seasonal clustering.
SEASON_THRESHOLD	0.01	If the incremental performance measure for adding a cluster is less than the threshold value, SAS Forecast Analyst Workbench stops performing seasonal clustering.
VOL_MAXCLUS	200	The maximum number of clusters generated by the FASTCLUS procedure for volume clustering.
VOL_THRESHOLD	0.02	If the incremental performance measure for adding a cluster is less than the threshold value, SAS Forecast Analyst Workbench stops performing volume clustering by using CLUSTER procedure.
CLUSTER_METHOD	Fast	The procedure to be used. The value **`Fast`** indicates to use the FASTCLUS procedure. The value **`Mode`** indicates to use MODECLUS procedure.
CLUSTER_DISTANCE_METRIC	Ward	The distance matrix to use. Possible values are **`Ward`** and **`Density`**.
SEGMENT	S1	The business segment that you can use for generating forecasting.
BYVAR_CLUS_PATN		By variable level that is used by seasonal clustering.
BYVAR_CLUS_VOL		By variable level that is used by volume clustering.
BYVAR_LOW		By variable that identifies the lowest level.
POTENTIAL_REGVAR		The variables that might serve as input during the modeling phase.
ATTRB_DIST		Attributes that are used in the seasonal cluster classification.
ATTRB_VOL		Attributes that are used for volume classification.
REG_CLASS		Class regression variables that are used in the volume regression.
REG_INPUT		All regression variables that are used as input in the volume regression.
NEURAL_INPUT_NOM		Nominal variables that are used in the neural network model.
NEURAL_INPUT_INT		Interval variables that are used in the neural network model.
CLUSTER_THRESHOLD	0.02	Threshold value that determines the number of clusters. The default value is **`0.02`**.

Parameter	Parameter Value	Description of the Parameter
VOLUME_MODEL	All	The model that must be used in the volume modeling. Possible values are **forest**, **reg**, **neural**, or **all**.
LOESS	0	Indicates whether to use the Loess smoothed likelihood to forecast the new product. The value **1** indicates to use the Loess smoothed likelihood.
DATEVAR	START_DT	Name of the date variable.
TIMEINT_SEASON	WEEK	Time interval in the input data set.
LIKELIHOOD_NAME	likelihood	Name of the likelihood vector.
LIKELIHOOD_LOESS _NAME	likelihood_loess	The name of the Loess likelihood smooth vector.
ACCUM_METHOD	Total	Method of accumulation.
INPUT_VAR		Input variables for analysis.
MAXITER	99	Maximum number of iterations in the neural network.
CONVERGE	0	Specifies the convergence criteria in the FASTCLUS procedure. Any nonnegative value is permitted.
BIN_NO		Specifies the number of bins used in the bin-sort algorithm for computing medians for LEAST=1. By default, the FASTCLUS procedure uses from 10 to 100 bins, depending on the amount of memory available. Larger values use more memory and make each iteration slower, but they can reduce the number of iterations. Smaller values have the opposite effect. The minimum value of n is 5.
THRESHOLD_PARAM	_SPRSQ_	The parameter that helps in measuring threshold in the CLUSTER procedure. If the incremental performance measure for adding a cluster is less than this threshold, then the CLUSTER procedure stops executing.
LOESS_SMOOTH	0.8	Specifies a list of positive smoothing parameter values in the LOESS procedure.
NPF_PREDICT_NAME		The name of the final prediction for new product forecasting.
HPSPLIT_TARGET_LV L	NOM	Specifies whether the target variable is interval or nominal in the HPSPLIT procedure.
HPSPLIT_INPUT_LVL	NOM	Specifies whether the input variables are interval or nominal in the HPSPLIT procedure.
HPFOREST_VARS	ALL	Variables to be used for the vars_to_try option in the HPFOREST procedure.
HPFOREST_TARGET _LVL	NOMINAL	Specifies whether the target variable is **NOMINAL**, **BINARY**, or **INTERVAL** in the HPFOREST procedure.

Parameter	Parameter Value	Description of the Parameter
HPFOREST_INPUT_LVL	NOMINAL	Specifies whether the input variable is **BINARY**, **NOMINAL**, **ORDINAL**, or **INTERVAL** in the HPFOREST procedure.
HPNEURAL_HIDDEN	3	Number of hidden layers in the neural network process.
HPNEURAL_TARGET_LVL	NOM	Specifies whether the target variable is interval or nominal in the neural network.
HPNEURAL_INPUT_LVL	NOM	Specifies whether the specified input variables are interval or nominal in the neural network.
HPNEURAL_MAXITER	1000	The maximum number of iterations in the neural network.
HPREG_METHOD	LASSO	Selection method in the HPREG procedure.
HPNEU_VOL_TARG_LVL	INT	Specifies the measurement level for the target variable. Possible values are **NOMINAL** or **NOM**, **ORDINAL** or **ORD**, and **INTERVAL** or **INT**.
HPNEU_VOL_INPUT_INT	INT	Specifies the measurement level for input variable, when the type of the input is interval.
HPNEU_VOL_INPUT_LVL	NOM	Specifies the measurement level for input. Possible values are **NOMINAL** or **NOM**, **ORDINAL** or **ORD**, and **INTERVAL** or **INT**.
HPNEU_VOL_MISS	MAP	Specifies how missing input is treated in the HPNEURAL procedure.
HPNEURAL_ACT	TANM	Specifies the activation function in the Target statement in the HPNEURAL procedure.
CLUSTER_NAME_C	CLUSTER	The name of the seasonal cluster variable in the train data.
CLUSTER_NAME_V	CLUSTER_VOL	The name of the volume cluster variable in the train data.
BYVAR_REG		By variable that might be used in the volume regression.
HPSPLIT_MISS	POPULAR	Specifies how the HPSPLIT procedure creates a default splitting rule to handle missing values.
MIN_N	10	The minimum number of observations required for training analysis. Time series with less than min_n observations are deleted.

For more information about HPFOREST, HPSPLIT, HPNEURAL, and HP4SCORE procedures, see *SAS Enterprise Miner 14.1: High-Performance Procedures* at http://support.sas.com/documentation/solutions/miner/emhp/14.1/emhpprcref.pdf.

9

Integrating SAS Forecast Analyst Workbench with SAS Financial Management

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Preparing Data to Integrate with SAS Financial Management

SAS Forecast Analyst Workbench is thoroughly integrated with SAS Financial Management for the collaboration planning process. When you are using the collaboration planning process, the data flows from SAS Forecast Analyst Workbench to the SAS Financial Management staging area, and then to the SAS Financial Management Data Mart (which is a PostgreSQL database).

To use SAS Financial Management to carry out the collaboration planning process:

1 Run the configuration job that is in SAS Data Integration Studio at the following location: `/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave04 (FM Integration - Configuration)/faw_0401_generate_fm_config_tables`.

   You must run the configuration job only once immediately after you deploy SAS Forecast Analyst Workbench. When you run the configuration job, the configuration tables (for example, CODE_LANGUAGE_REF,

COUNTRY_REF, and CURRENCY) and UIART table (for example, PLAN_FORM_DETAILS) are created.

2 Run the initial one-time jobs that are in SAS Data Integration Studio at the following location: **/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave05 (FM Integration - Initial One Time)**.

You must run the initial one-time jobs only once immediately after you deploy SAS Forecast Analyst Workbench and edit the configuration tables. When you run the initial one-time jobs, the following steps are performed:

a Configuration tables in the SAS Financial Management staging area are created. An empty structure for all valid dimensions is also created in the staging area.

The dimension keys are also incorporated in the SAS Financial Management fact table that is in the staging area.

b The data locale (code language), dimension types, and dimensions are loaded into the SAS Financial Management Data Mart.

3 Run the ongoing jobs that are in SAS Data Integration Studio at the following location: **/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave06 (FM Integration - Data Loading)**.

These jobs load the dimension members and user authorization for dimension members from SAS Forecast Analyst Workbench into the SAS Financial Management staging area. These jobs also load the dimension members, users, groups, and user_x_groups from the SAS Financial Management staging area to the SAS Financial Management Data Mart.

Integration Jobs for SAS Financial Management

Overview of Integration Jobs

If the plan file includes the license for SAS Financial Management, you must run the jobs that are related to SAS Financial Management integration. The integration jobs are categorized as configuration jobs, initial jobs, and ongoing jobs.

Configuration Job

SAS Forecast Analyst Workbench data is integrated with SAS Financial Management in order to perform the collaboration planning. You can run the configuration job that is in SAS Data Integration Studio at the following location: **/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave04 (FM Integration - Configuration)/faw_0401_generate_fm_config_tables**.

After you run the configuration job, the following tables are created in the configuration library:

- CODE_LANGUAGE_REF

- COUNTRY_REF
- CURRENCY
- PLAN_FORM_DETAILS

In addition to these configuration tables, the PLAN_FORM_DETAILS table is also created in the UIART library.

Initial Jobs

The initial jobs are in SAS Data Integration Studio at the following location: **`/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave05 (FM Integration - Initial One Time)`**.

The following table provides detailed information about the initial jobs.

Table 9.1 *Initial Jobs*

Job Name	Description	Required Input
faw_0501_load_fm_stg_config_tables	Populates the following tables in the staging area of SAS Financial Management: ■ APP_DIMENSION ■ APP_PROPERTY ■ APP_MEMBER_PROPERTY ■ CODE_LANGUAGE ■ COUNTRY ■ DIMENSION_TYPE To populate these tables, data must be populated into the required tables, which are listed in the Required Input column. These tables in the SAS Financial Management staging area are mandatory, including the default country code and language code values. The job performs the following functions: ■ creates empty structures for all valid dimension tables with respect to SAS Forecast Analyst Workbench in the SAS Financial Management staging area (for example, PRODUCT, PRODUCT_ASSOC_TYPE, PRODUCT_ASSOC, PRODUCT_NLS) ■ creates empty structures for the STAKEHOLDER dimension ■ loads all the required valid dimension types, dimensions, and attributes of all dimensions with respect to SAS Forecast Analyst Workbench into the SAS Financial Management staging area ■ updates the SAS Financial Management fact table ■ incorporates all the dimension keys into the SAS Financial Management fact table GL_TRANSACTION_SUM, with respect to SAS Forecast Analyst Workbench	The following tables are required with business-specific data: ■ CODE_LANGUAGE_REF ■ COUNTRY_REF ■ DIM_TABLE_LIST ■ SAS_DIMENSION_TYPE ■ DIM_VAR_DISP_LIST

Job Name	Description	Required Input
faw_0502_load_fm_sdm_data_locale	Populates the data locale (code language) from the SAS Financial Management staging area into the SAS Financial Management Data Mart.	Before you run this job, you must have executed the faw_0501_load_fm_stg_config_tables job and the following tables must be populated with data that is specific to SAS Forecast Analyst Workbench: ■ COUNTRY ■ CODE_LANGUAGE
faw_0503_create_fm_sdm_dimension_types	Populates all the required dimension types from the SAS Financial Management staging area into the SAS Financial Management Data Mart.	Before you run this job, you must have executed the faw_0501_load_fm_stg_config_tables job and ensured that the data is populated in the DIMENSION_TYPE table in the SAS Financial Management staging area.
faw_0504_create_fm_sdm_dimensions	Populates all required dimensions from the SAS Financial Management staging area into the SAS Financial Management Data Mart. **Note:** Before you run this job on a multibyte SAS session, you might need to complete the tasks that are documented at http://support.sas.com/kb/52/372.html.	Before you run this job, you must have executed the faw_0501_load_fm_stg_config_tables job and ensured that the data is populated in the following tables in the SAS Financial Management staging area: ■ APP_DIMENSION ■ APP_PROPERTY ■ APP_MEMBER_PROPERTY ■ DIMENSION_TYPE

Ongoing Jobs

After you run the initial jobs, you must run the ongoing jobs. The ongoing jobs are categorized as the jobs that load data into the SAS Financial Management staging area and from the staging area into the SAS Financial Management Data Mart.

The faw_0601_load_fm_stg_dimensions job loads the SAS Forecast Analyst Workbench dimension data into the SAS Financial Management staging area. The following table provides detailed information about this job.

Table 9.2 *Ongoing Jobs*

Job Name	Job Description	Required Input
faw_0601_load_fm_stg_dimensions	Populates the dimension data for the following dimensions into the SAS Financial Management staging area: ■ TIME PERIOD ■ ACCOUNT ■ CURRENCY ■ INTORG (Internal Organization) ■ ANALYSIS ■ STAKEHOLDER ■ All valid SAS Forecast Analyst Workbench dimensions (for example, PRODUCT, STORE_LOCATION) ■ UNDER_X_MEMBERS This table associates the user with a dimension member for workflow purposes (which is valid only if those dimension members are used in the target hierarchy of the formset). This job also populates the default hierarchy records for the INTORG (internal organization), CURRENCY, and STAKEHOLDER dimensions.	The following tables of the SAS Forecast Analyst Workbench Configuration Tables library must be populated with business-specific data: ■ KPI_CONFIG ■ ANALYSIS_VAR The following tables in the solution data layer must be populated with business-specific data: ■ TIME_PERIOD_**<Calendar_Type>** ■ TIME_PERIOD_ASSOC_TYPE ■ TIME_PERIOD_ASSOC ■ STAKEHOLDER ■ STAKEHOLDER_ASSOC ■ All valid SAS Forecast Analyst Workbench dimensions (for example, PRODUCT, STORE_LOCATION) ■ AUTH_ENTRY table in the UIART library

The following jobs load the data from the SAS Financial Management staging area into the SAS Financial Management Data Mart :

1. faw_0602_load_fm_sdm_users
2. faw_0603_load_fm_sdm_groups
3. faw_0604_load_fm_sdm_users_x_groups
4. faw_0605_load_fm_sdm_dimensions

These jobs are in SAS Data Integration Studio at the following location: **/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave06 (FM Integration - Data Loading)**

The following table provides information about the ongoing jobs.

Table 9.3 Ongoing Jobs

Job Name	Description	Required Input
faw_0602_load_fm_sdm_users	Populates valid SAS Forecast Analyst Workbench users into the SAS Financial Management Data Mart. **Note:** After you run this job, you might receive a warning message. You can ignore this message.	
faw_0603_load_fm_sdm_groups	Populates valid SAS Forecast Analyst Workbench user groups into the SAS Financial Management Data Mart. **Note:** After you run this job, you might receive a warning message. You can ignore this message.	
faw_0604_load_fm_sdm_users_x_groups	Populates valid SAS Forecast Analyst Workbench USER_X_GROUPS into the SAS Financial Management Data Mart. **Note:** After you run this job, you might receive a warning message. You can ignore this message.	
faw_0605_load_fm_sdm_dimensions	Populates all dimension members along with user authorizations for all valid dimension members from the following tables in the SAS Financial Management staging area into the SAS Financial Management Data Mart: ■ TIME_PERIOD ■ ACCOUNT ■ CURRENCY ■ INTORG (Internal Organization) ■ ANALYSIS ■ STAKEHOLDER ■ All valid SAS Forecast Analyst Workbench dimensions (for example, PRODUCT, STORE_LOCATION) This job also populates the default hierarchy records for the INTORG (internal organization), CURRENCY, and STAKEHOLDER dimensions from the SAS Financial Management staging area into the SAS Financial Management Data Mart.	You must execute the faw_0601_load_fm_stg_dimensions job before you execute this job. The following tables in the SAS Financial Management staging area must be populated with business-specific data: ■ TIME_PERIOD ■ ACCOUNT ■ CURRENCY ■ INTORG (Internal Organization) ■ ANALYSIS ■ STAKEHOLDER ■ All valid SAS Forecast Analyst Workbench dimensions (for example, PRODUCT, STORE_LOCATION)

SAS Financial Management Configuration Tables

CODE_LANGUAGE_REF

The CODE_LANGUAGE_REF table is required when you are using SAS Financial Management to perform collaboration planning. This table contains a row for each language or locale that is used in the solution. This table is required.

Table 9.4 *Description of the CODE_LANGUAGE_REF Table*

Column Name	Description	Data Type	Editable?	Sample Value
LANGUAGE_CD	A code that identifies a language or locale (for example, en).	Char (3)	Yes	en
LANGUAGE_DESC	Description of the character code that identifies the languages.	Char (255)	Yes	ENGLISH
DEFAULT_LANGUAGE_FLG	Flag that indicates the default language code that is used in SAS Financial Management. The language or locale is used for the names and descriptions in the tables that do not use LANGUAGE_CD as part of the key.	Char (1)	Yes	Y
LOCALE_LANGUAGE_CD	The 2-character language code that is associated with the locale.	Char (2)	Yes	en
LOCALE_VARIANT_CD	This column is blank by default. This column can be used as the third parameter in the aggregate locale string that is used by the Data Mart.	Char (32)	Yes	
LOCALE_COUNTRY_CD	The 2-character standard code for a country (for example, AF for Afghanistan and AL for Albania).	Char (2)	Yes	US
PROCESSED_DTTM	The time at which a particular row of data was created or most recently modified by the job.	Number	Yes	04MAY2011:15:47:00

COUNTRY_REF

The COUNTRY_REF table contains 2-character country codes that conform to the ISO 3166 standard. This table is required.

Table 9.5 *Description of the COUNTRY_REF Table*

Column Name	Description	Data Type	Editable?	Sample Value
COUNTRY_CD	A 2-character code for a country (for example, AF for Afghanistan, AL for Albania).	Char (3)	Yes	US
COUNTRY_DESC	Country name or description for the unique 2-character code.	Char (255)	Yes	United States
COUNTRY_REGION_DESC	Regional location of the country (for example, North America, Eastern Europe, and Asia).	Char (255)	Yes	US
LANGUAGE_CD	A code that identifies the language or locale that is used for names and descriptions. The code must be defined in the CODE_LANGUAGE table (for example, en for English).	Char (3)	Yes	en
PROCESSED_DTTM	The time at which a row of data was created or most recently modified by the job.	Number	Yes	04MAY2011:09:55:00

CURRENCY

The CURRENCY table contains the list of standard 3-character ISO 4217 codes. These codes are used to identify currency codes that are required by SAS Financial Management. This table is required.

Table 9.6 *Description of the CURRENCY Table*

Column Name	Description	Data Type	Editable?	Sample Value
CURRENCY_CD	Standard 3-character code used to identify currency (for example, USD for US dollar).	Char (3)	No	USD
CURRENCY_DESC	Currency name or description for the unique 3-character code.	Char (255)	No	US Dollar
LANGUAGE_CD	A code that identifies the language or locale that is used for names and descriptions. The code must be defined in the CODE_LANGUAGE table (for example, en for English).	Char (3)	No	en
CONVERTED_TO_EURO_FLG	Indicates whether the currency was converted to the Euro.	Char (1)	No	N
PROCESSED_DTTM	The time at which a row of data was created or most recently modified by the job.	Number	Yes	04MAY2011:09:55:00

ANALYSIS_VAR

The ANALYSIS_VAR table contains a list of all the analysis variables that are used to measure the KPI values. After you deploy SAS Forecast Analyst Workbench, this table is populated with the following default analysis variables:

- ACTUAL
- PREDICTED
- CONSENSUS
- OVERRIDE

You can also add custom analysis variables in order to perform collaboration planning. You can add a row to this table in order to add additional custom analysis variables. You must seed the custom analysis variable to use it in the collaboration planning process. For more information about configuring and seeding analysis variables, see *SAS Forecast Analyst Workbench: User's Guide*.

Table 9.7 *Description of the ANALYSIS_VAR Table*

Column Name	Description	Data Type	Editable?	Sample Value
ANALYSIS_VAR_RK	Unique number of the analysis variable. This column is mandatory.	Number	No	3
ANALYSIS_VAR_ADK	Unique code that identifies the new dimension in SAS Financial Management. This code is used to integrate SAS Forecast Analyst Workbench with SAS Financial Management. This column is mandatory when you are using collaboration planning.	Char (32)	No	ANALYSIS
ANALYSIS_VAR_ID	Unique identifier for the analysis variable. This value represents the column name in the fact table. This column is mandatory. This column value must be a valid SAS name. For more information about SAS naming conventions, see *SAS Language Reference: Concepts*.	Char (32)	No	FINAL
ANALYSIS_VAR_DESC	Short description of the analysis variable.	Char (255)	Yes	This variable contains the collaboration values

Column Name	Description	Data Type	Editable?	Sample Value
LANGUAGE_CD	A code that identifies the language or locale for names and descriptions. The code must be defined in the CODE_LANGUAGE configuration table. The value in this column must match the value that is specified in the GL_FM_DEFAULT_LANGUAGE_CD parameter. For more information about the GL_FM_DEFAULT_LANGUAGE_CD parameter, see "About the Configuration Parameters" on page 35. This column is mandatory when you are using collaboration planning.	Char (3)	Yes	en
ANALYSIS_VAR_NM	Name of the analysis variable. This column is mandatory when you are using collaboration planning.	Char (40)	No	FINAL
ANALYSIS_VAR_DISPLAY_NM	Name of the analysis variable that is displayed in the user interface. This column is mandatory.	Char (40)	Yes	FINALS
ANALYSIS_DEFAULT_IND	The default analysis variables. You must not change this analysis variable. However, you can add more analysis variables that are available by default on the user interface. The value `1` indicates that the analysis variable is a default variable. The value `0` indicates that the analysis variable is not a default variable.	Number	Yes	1

Column Name	Description	Data Type	Editable?	Sample Value
ANALYSIS_DEFAULT_EXTRACT_IND	The default analysis variable to extract the data from SAS Financial Management. The value `1` indicates that the analysis variable is marked to extract data from SAS Financial Management. The value `0` indicates that the analysis variable is not marked to extract data from SAS Financial Management. The analysis variables that are marked with `1` are shown as default analysis variables to extract data on the user interface. **Note:** At least one analysis variable must have the value `1`.	Number	Yes	0
DEFAULT_LOAD_TYPE_RK	The default load condition for the analysis variable. The information about load condition is obtained from the LOAD_TYPE and ANALYSIS_VAR_X_LOAD_TYPE tables.	Number	Yes	1

ANALYSIS_VAR_X_LOAD_TYPE

The ANALYSIS_VAR_X_LOAD_TYPE table contains information about the analysis variables and their respective load types. You can use the ANALYSIS_VAR and LOAD_TYPE tables to enter information into this table. Based on the information that you enter in this table, the load condition appears in the user interface for collaboration planning.

Table 9.8 *Description of ANALYSIS_VAR_X_LOAD_TYPE Table*

Column Name	Description	Data Type	Editable?	Sample Value
ANALYSIS_VAR_RK	Unique key for the analysis variable. Refer to the ANALYSIS_VAR table for unique keys.	Number	Yes	1

Column Name	Description	Data Type	Editable?	Sample Value
LOAD_TYPE_RK_COMMA	Conditions for loading the data into SAS Financial Management. For more information about macros, see "LOAD_TYPE" on page 123. By default, this column contains the value 0, indicating that all values are loaded. Separate load conditions with a comma.	Number	Yes	0

CONSENSUS_PLAN_TEMPLATE_LIST

The CONSENSUS_PLAN_TEMPLATE_LIST table provides templates in case an additional dimension is used for a plan. Use this table in collaboration planning. The following table describes the columns of the CONSENSUS_PLAN_TEMPLATE_LIST table.

Table 9.9 *Description of CONSENSUS_PLAN_TEMPLATE_LIST Table*

Column Name	Description	Data Type	Editable?	Sample Value
CONSENSUS_PLAN_TEMPLATE_ID	Unique identification of the template.	Char (32)	Yes	sample
CONSENSUS_PLAN_NM	Name of the plan.	Char (40)	Yes	Europe
CONSENSUS_PLAN_MACRO_NM	Name of the template that is used to load the additional dimension.	Char (40)	Yes	template.sas

LOAD_TYPE

The LOAD_TYPE table is used during seeding. The LOAD_TYPE table contains sample templates that are provided by SAS Forecast Analyst Workbench. You can add more seeding templates depending on your business requirements. This table is used for performing collaboration planning.

Table 9.10 *Description of LOAD_TYPE Table*

Column Name	Description	Data Type	Editable?	Sample Value
LOAD_TYPE_RK	Unique key for load type.	Number	No	0
LOAD_TYPE_DISP_NAME	The display name of the load type.	Char (40)	Yes	Seeding predicted
LOAD_TYPE_DESC	Description of the load type.	Char (255)	Yes	Load all values
LOAD_TYPE_MACRO_NM	Name of the load type template. SAS Forecast Analyst Workbench provides the default templates. You can place the customized templates in the `templates` folder.	Char (255)	Yes	ddcf_fm_seeding_sample1.sas

10

Integrating SAS Forecast Analyst Workbench with SAS Visual Analytics

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Guidelines for Integrating SAS Forecast Analyst Workbench with SAS Visual Analytics

You can integrate the output of SAS Forecast Analyst Workbench into SAS Visual Analytics. Using SAS Forecast Analyst Workbench data in SAS Visual Analytics, you can create reports to analyze the data in the way that you want. You use SAS LASR Analytic Server along with SAS Visual Analytics to build and generate the reports.

Use the following guidelines in order to integrate SAS Forecast Analyst Workbench with SAS Visual Analytics:

- Ensure that the SAS metadata contains the following SAS LASR Analytic Servers and corresponding libraries:

Table 10.1 SAS Metadata and Libraries

SAS LASR Analytic Server	Associated LASR Library Name	Libref	SAS Visual Analytics Metadata Folder
LASR Analytic Server <*machine name*>	Visual Analytics LASR	`VALIBLA`	`/Products/SAS Visual Analytics Administrator`
Public LASR Analytic Server <*machine name*>	Visual Analytics Public LASR	`LASRLIB`	`/Shared Data/SAS Visual Analytics/ Public`

- Ensure that the following groups are already present in SAS Management Console:
  - Visual Analytics Data Administrators
  - Visual Data Builder Administrators
  - Visual Analytics Users
- Ensure that the users who are using SAS Visual Analytics to generate the reports are associated with one of the above groups.

  Note: If no user is present for SAS Visual Analytics, you can create the users and associate them with the groups.

  TIP If SAS LASR Analytic Server is distributed on a grid, then you must place the .ssh file in the user folder on the machine that is associated with SAS metadata.

- Start the SAS LASR Analytic Server from the Manage Environment view of SAS Visual Analytics before creating reports. To start the SAS LASR Analytic Server:

  1. Log on to SAS Visual Analytics Hub as a user who is a member of the Visual Analytics Data Administrators group and of the Visual Data Builder Administrators group.
  2. On the **Common Actions** pane, click **Manage Environment**. The Manage Environment page appears in a new tab of the browser or in a new window based on the browser settings.
  3. On the Manage Environment page, select **LASR** ▸ **Manage Servers**. The **LASR Servers** tab appears in the right pane.
  4. Select a server and click ▶.

Preparing Data to Integrate with SAS Visual Analytics

When you are using SAS Visual Analytics, the data flows from SAS Forecast Analyst Workbench to a Base SAS library, to the SAS LASR Analytic Server library, and then to SAS Visual Analytics.

To use SAS Visual Analytics:

1 In the GL_FAW_LASRLIBNAME parameter, enter the name of the library to which you want to upload the data on SAS LASR Analytic Server.

By default, the name of the library is SAS Visual Analytics LASR. You can change the name of the library.

For more information about the GL_FAW_LASRLIBNAME parameter, see "About the Configuration Parameters" on page 35.

Note: Enter the exact name of the library to which you want to upload the data on SAS LASR Analytic Server.

2 Run the following ETL jobs that are present at **`/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave09 (VA Integration - Data Preparation)`** location in SAS Data Integration Studio:

- faw_0901_actual_and_indepvars
- faw_0902_timeseries
- faw_0903_consensus_plan
- faw_0904_create_config_for_outcomponent
- faw_0905_outcomponent

3 Run the faw_1001_upload_to_LASR job that is located at the following location in SAS Data Integration Studio: **`/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave10 (VA integration - Data Upload to LASR)`**

When you run this job, the data from FAW_VA library is copied to the <SAS Visual Analytics LASR> library that is present in SAS LASR Analytic Server and is automatically registered with SAS metadata in the folder **`/Products/SAS Forecast Analyst Workbench/Data Sources/Visual Analytics LASR`**.

Note: The SAS LASR Analytic Server must be in the running state while it is executing this job so that the data is uploaded to the SAS LASR Analytic Server. If the SAS LASR Analytic Server is stopped for any reason, then the data that is present in the <SAS Visual Analytics LASR> library is lost. After the SAS LASR Analytic Server is started, you can reload the data by running the faw_1001_upload_to_LASR job. In this way, the complete set of data is uploaded to the <SAS Visual Analytics LASR> library from FAW_VA library.

If you want to upload the incremental data that is not a part of the tables that are created by Wave09 jobs in an ad hoc way to the <SAS Visual Analytics LASR> library, run the faw_1002_adhoc_incremental_upload_to_LASR job that is located at the following location in SAS Data Integration Studio: **`/`**

Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave10 (VA integration - Data Upload to LASR).

Integration Jobs for SAS Visual Analytics

In order to load the summarized data of a forecast into SAS Visual Analytics, you must run the integration jobs for SAS Visual Analytics. The integration jobs are in SAS Data Integration Studio at the following locations:

- **/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave09 (VA integration - Data Prepartion)**
- **/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave10 (VA integration - Data Upload to LASR)**

The following table describes the integration jobs.

Table 10.2 *Data Preparation Jobs for SAS Visual Analytics*

Job Name	Description
faw_0901_actual_and_indepvars	Creates the forecast-specific tables in the following format in FAW_VA library: PLAN_RSLT_SUMMARY_DATA<PLAN_ID>. The output table contains information about the actual and predicted values of the KPI, with independent variables, present in the forecast. If the status of the forecast is **Forecasted**, the predicted value for the KPI exists. If the status of the forecast is **Created**, the predicted values for the KPI are missing. The PLAN_DETAILS table is also generated in the FAW_VA library. This table contains two columns, plan_id and Plan_nm, which provide information about the forecasts. If the forecast name is **sample** and the forecast ID is **1**, the name of the PLAN_RSLT_SUMMARY_DATA<PLAN_ID> table is PLAN_RSLT_SUMMARY_DATA1. **Note:** In order to run this job, you must have at least one forecast in SAS Forecast Analyst Workbench.

faw_0902_timeseries	Creates the forecast-specific tables in the following format in the FAW_VA library:
	
	- time series-related data is stored in the following format: PLAN_FCST_DETAILS<PLAN_ID>.
	
	  This table contains information about the actual and independent variables for the forecasted dates.
	
	- data is stored in the following format: PLAN_STAT_DETAILS<PLAN_ID>.
	
	  This table contains statistical information about the MAPE, RMSE, prediction MAPE, and prediction APE.
	
	Generates the PLAN_DETAILS table in the FAW_VA library. This table contains the association between the forecast ID and the forecast name. The PLAN_ID column shows the forecast ID for a particular forecast.
	
	Note: In order to run this job, you must have at least one forecast in SAS Forecast Analyst Workbench.

Job Name	Description
faw_0903_consensus_plan	Creates the plan_forecast_fact table for each plan in the FAW_VA library. The CONSENSUS_PLAN_DETAILS table (containing the plan name and number) is generated in the FAW_VA library. This table contains the association of the plan number with the name. In order to run this job, you must have purchased the collaboration license and collaboration planning must be working smoothly. **Note:** In order to run this job, you must have at least one plan in SAS Forecast Analyst Workbench.
faw_0904_create_config_for_outcomponent	Creates the configuration table that is required for running the faw_0905_outcomponent job. This configuration table is created in the config library. You can edit the values for the driver group and for the variable group. The value for the metric name is provided by SAS Forecast Analyst Workbench.
faw_0905_outcomponent	The waterfall data for each forecast is successfully predicted and the WATERFALL<PLAN_ID> table is created in the FAW_VA library with waterfall data. **Note:** In order to run this job, you must have at least one forecast in SAS Forecast Analyst Workbench.
faw_1001_upload_to_LASR	Loads the data from the FAW_VA library to the Visual Analytics LASR library.
faw_1002_adhoc_incremental_upload_to_LASR	Loads the incremental data from the FAW_VA library to the Visual Analytics LASR library in an ad hoc manner.

SAS Visual Analytics Integration Tables

Introduction to SAS Visual Analytics Integration Tables

The data that you extract from SAS Forecast Analyst Workbench is stored in the following tables:

- PLAN_RSLT_SUMMARY_DATA<PLAN_ID>
- PLAN_FCST_DETAILS<PLAN_ID>
- PLAN_STAT_DETAILS<PLAN_ID>
- PLAN_FORECAST_FACT<Collaboration plan_ID>
- WATERFALL<PLAN_ID>

Separate data sets are created for data that is extracted for each forecast. The data set names are suffixed with the plan ID. This section provides detailed information about the data sets.

PLAN_RSLT_SUMMARY_DATA<PLAN_ID>

This data set contains historical data for the KPI and independent variables.

Table 10.3 The PLAN_RSLT_SUMMARY_DATA<PLAN_ID> Table

Table type	Fact
Data loading strategy	Insert else update
Load type	New records are inserted and old records are deleted.
Primary key	None
Whether the table is optional	Yes

The following table describes the columns of the PLAN_RSLT_SUMMARY_DATA<PLAN_ID> table.

Table 10.4 Description of PLAN_RSLT_SUMMARY_DATA<PLAN_ID> Table

Column Name	Description	Type	Null Option
MIXED_HIER_NO	Mixed hierarchy number.	Number	Not null
Dimension RKs corresponding to the associated dimensions of the forecast at the forecast granularity for the dimensions			Not null
FCST_DATE	Start day of the calendar day.	Number	Null
ACTUAL_DEMAND	Actual values of the selected KPI in the forecast.	Number	Null
PREDICTED_DEMAND	Predicted demand.	Number	Null
FS_OVERRIDE	Forecast override.	Number	Null
FORECAST_LCL	Forecasting lower control limit.	Number	Null
FORECAST_UCL	Forecasting upper control limit.	Number	Null
ORDER	Order information.	Number	Not null

Column Name	Description	Type	Null Option
Independent variable name	Name of the independent variable. The independent variables appear only when they are used in the forecast.	Char	

PLAN_FCST_DETAILS<PLAN_ID>

The PLAN_FCST_DETAILS<PLAN_ID> table contains information about time series.

Table 10.5 *The PLAN_FCST_DETAILS<PLAN_ID> Table*

Table type	Fact
Data loading strategy	Insert else update
Load type	New records are inserted and old records are deleted.
Primary key	None
Whether the table is optional	Yes

The following table describes the columns of the PLAN_FCST_DETAILS<PLAN_ID> table.

Table 10.6 *Columns of the PLAN_FCST_DETAILS<PLAN_ID> Table*

Column Name	Description	Type	Null Option
Dimension RKs corresponding to the associated dimensions of the plan at the plan granularity for the dimensions			These are all not null columns.
FCST_DATE	Start date of the calendar day.	Number	Null
ACTUAL_DEMAND	Actual demand of the plan.	Number	Null
PREDICTED_DEMAND	Predicted demand	Number	Null
FS_OVERRIDE	Forecast override	Number	Null
FORECAST_LCL	Forecasting lower control limit	Number	Null

Column Name	Description	Type	Null Option
FORECAST_UCL	Forecasting upper control limit	Number	Null
Independent variable name	Name of the independent variable	Char	Null

PLAN_STAT_DETAILS<PLAN_ID>

The PLAN_STAT_DETAILS<PLAN_ID> table contains information about components of the forecast, such as MAPE and RMSE.

Table 10.7 *The PLAN_STAT_DETAILS<PLAN_ID> Table*

Table type	Fact
Data loading strategy	Insert-update
Load type	New records are inserted and old records are deleted.
Primary key	None
Whether the table is optional	Yes

The following table describes the columns of the PLAN_STAT_DETAILS<PLAN_ID> table.

Table 10.8 *Columns of the PLAN_STAT_DETAILS<PLAN_ID> Table*

Column Name	Description	Type	Null Option
Dimensions RKs corresponding to the associated dimensions of the forecast at the forecast granularity for the dimensions.			These are all not null columns.
MAPE	Mean absolute percent error.	Number	Null
RMSE	Root mean square error.	Number	Null
PREDICTION_APE	Predicted absolute percent error.	Number	Null
PREDICTION_MAPE	Predicted mean absolute percent error.	Number	Null

PLAN_FORECAST_FACT <PLAN_ID>

The PLAN_FORECAST_FACT <PLAN_ID> table contains information about collaboration plans.

Table 10.9 The PLAN_FORECAST_FACT <PLAN_ID> Table

Table type	Fact
Data loading strategy	Insert-update
Load type	New records are inserted and old records are deleted.
Primary key	None
Whether the table is optional	Yes

The following table describes the columns of the PLAN_FORECAST_FACT <PLAN_ID> table.

Table 10.10 Columns of the PLAN_FORECAST_FACT <PLAN_ID> Table

Name	Description	Type	Null Option
FCST_DATE	Start date of the calendar day.	Number	Null
FCST_PLAN_ID	Collaboration plan ID.	Number	Null
ACTUAL	Actual values.	Number	Null
PREDICTED	Predicted or forecasted values.	Number	Null
CONSENSUS	Collaboration values.	Number	Null
OVERRIDE	Name of the override parameter.	Char	Null
Dimension IDs	Dimension IDs.	Char	Null

WATERFALL<PLAN_ID>

The WATERFALL<PLAN_ID> table contains information about the components of a fitted model.

Table 10.11 The WATERFALL<PLAN_ID> Table

Table type	Fact
Data loading strategy	Insert-update
Load type	New records are inserted and old records are deleted.
Primary key	None
Whether the table is optional	Yes

The following table describes the columns of the WATERFALL<PLAN_ID> table.

Table 10.12 Columns of the WATERFALL<PLAN_ID> Table

Column Name	Description	Type	Null Option
METRICNAME	Name of the components within the fitted model.	Char	Null
PLAN_ID	Forecast ID.	Number	Null
KPI_NM	Name of the key performance indicator that is to be forecasted.	Char	Null
DUETO_VALUE	Predicted values.	Number	Null
MAPE	Mean absolute percent error value.	Number	Null
ERROR_PCT	Error, in percent.	Number	Null
APE	Absolute percent error value.	Number	Null
Time levels from year to periodicity			
DRIVER_GROUP	Name of the driver group. For example, BASE, FORECAST_VOL	Char	Null
VARIABLE_GROUP	Name of the variable group.	Char	Null
DIMENSION IDs until the leaf node for forecasting			

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Integrating SAS Forecast Analyst Workbench with Another SAS Solution

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About Integrating SAS Forecast Analyst Workbench with Another SAS Solution

You can integrate SAS Forecast Analyst Workbench with another SAS solution seamlessly and transparently. For example, you can integrate SAS Forecast Analyst Workbench with SAS Inventory Optimization Workbench. You can leverage the prediction capability of SAS Forecast Analyst Workbench to integrate the predicted values into another SAS solution and gain an advantage by solving your business challenge. You can perform advanced tasks in another SAS solution by using the predicted values that are generated by SAS Forecast Analyst Workbench.

Integrate SAS Forecast Analyst Workbench with Another SAS Solution

To integrate SAS Forecast Analyst Workbench with another SAS solution:

1 Run the following job through SAS Data Integration Studio: `/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave07 (Integration - Other Solutions)/faw_0701_create_integration_config_tables`

After this job runs, SAS Forecast Analyst Workbench creates the following tables:

- PLAN_HIERARCHY_CONFIG
- PLAN_KPI_CONFIG

These configuration tables are created in the path that is specified in the GL_INT_LIB parameter. For more information about the GL_INT_LIB parameter, see "About the Configuration Parameters" on page 35.

2 Edit the configuration tables with your business-specific information.

SAS Forecast Analyst Workbench uses the information that is specified in the configuration tables to generate predicted values. For more information about these configuration tables, see "Integration Configuration Tables" on page 136.

You can use another SAS solution (such as SAS Inventory Optimization Workbench) to create a forecast with your business-specific information. SAS Forecast Analyst Workbench generates the predicted values in the output table in the specified library. You can use the predicted values that are in this table in your SAS solution for further processing.

Integration Configuration Tables

About Integration Configuration Tables

The integration configuration tables are created after you run the faw_0701_create_integration_config_tables job through SAS Data Integration Studio. The following tables are created in the path that is specified in the GL_INT_LIB parameter:

- PLAN_HIERARCY_CONFIG
- PLAN_KPI_CONFIG

PLAN_HIERARCHY_CONFIG

The PLAN_HIERARCHY_CONFIG table contains the following information that is required for creating a forecast:

- hierarchy name
- hierarchy level
- order of the hierarchy
- forecast leaf-level
- reconciliation level

You must specify the values in this table so that the predicted values can be generated. The following table describes the columns of the PLAN_HIERARCHY_CONFIG table.

Table 11.1 *Columns of the PLAN_HIERARCHY_CONFIG Table*

Column Name	Description	Type	Editable?
INPUT_COLUMN_NAME	Name of the column that is used in another SAS solution (for example, SAS Inventory Optimization Workbench). SAS Forecast Analyst Workbench generates the predicted values for the values of this column. **Note:** You cannot select only the lowest-level leaf node. You must select the parent node of the lowest-level leaf node in the hierarchy.	Char	Yes
FAW_DIM_RK	Unique dimension key that corresponds to the INPUT_COLUMN_NAME.	Number	Yes
FAW_DIM_HIER_LEVEL	Hierarchy level of the dimension that you want to use in order to generate the predicted values.	Number	Yes
FAW_PLAN_ORDER	Order of the hierarchy level that can be used to generate the predicted values.	Number	Yes
FAW_FORECAST_LVL_IND	Forecast leaf-level indicator. Enter `1` to specify that the hierarchy level is the leaf-level node. You can specify the value `1` in only one row of this column.	Number	Yes
FAW_RECONCILE_LVL_IND	The reconciliation level indicator. Enter `1` in order to specify that the hierarchy level is the reconciliation level. You can specify the value `1` in only one row of this column.	Number	Yes

PLAN_KPI_CONFIG

The PLAN_KPI_CONFIG table contains the following information that is required for creating a forecast:

- KPI name
- low history threshold
- number of periods that contain historical data
- number of periods in the forecast horizon
- number of periods that contain historical data for act-like relationships

You must specify the values in this table so that the predicted values can be generated. The following table describes the columns of the PLAN_KPI_CONFIG table.

Table 11.2 *Columns of the PLAN_KPI_CONFIG Table*

Column Name	Description	Type	Editable?
FAW_DEMAND_KPI_NM	Name of the KPI that you want to use in order to create the forecast. The name of the KPI must match the name of the KPI that is specified in the CONFIG.KPI_CONFIG table.	Char	Yes
LOW_HISTORY_THRESHOLD	Low history threshold. Always set this column to `1`.	Number	Yes
FORECAST_PAST_PERIODS	The number of periods of historical data that you require.	Number	Yes
NO_OF_FORECASTED_PERIOD	The number of periods in the forecast horizon that you require.	Number	Yes
ACT_LIKE_THRESHOLD	The number of periods of historical data that is required to define an act-like relationship.	Number	Yes

Part 4

Customizing SAS Forecast Analyst Workbench

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12

Adding a Calendar for Collaboration

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About Adding a Calendar for Collaboration

SAS Forecast Analyst Workbench enables you to add a calendar in addition to the one that you are already using. You can use this calendar only for collaboration and not for forecasting. Suppose the financial year is different from the Gregorian calendar or from the one that you are using, and you want to perform collaboration planning based on the financial year. In this case, you would add an additional calendar for the collaboration.

After you add a calendar to SAS Forecast Analyst Workbench, the predicted demand data is adjusted according to the newly added calendar.

Add a Calendar

When you are adding a custom calendar, the following prerequisites apply:

- Ensure that the data, which is loaded in the following Stage tables, is valid: STG_TIME_PERIOD, STG_TIME_PERIOD_ASSOC, and STG_TIME_PERIOD_LVL. For more information about calendar format, see “Date Intervals, Formats, and Functions” in *SAS/ETS: User's Guide*.
- The dates that are being loaded to the STG_TIME_PERIOD, STG_TIME_PERIOD_ASSOC, and STG_TIME_PERIOD_LVL tables in the Stage library must correctly align with the granularity of the time period. For example, suppose the tables are populated at the weekly and monthly granularity. In this case, a week cannot be split over two consecutive months (in other words, the month must contain dates for the entire week).

To add a calendar for collaboration:

1. Open the following job in the SAS Data Integration Studio workspace: `/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave08 (Utilities)/faw_0801_load_planning_time_dim`
2. Right-click in the empty area of the workspace, and select **Properties**. The Properties dialog box appears.

3 On the **Precode and Postcode** tab of the Properties dialog box, enter information for the parameters. The following table describes the parameters of the job.

Table 12.1 Parameter Description

Parameter	Description
Planning calendar type indicator	Specify the planning calendar type indicator to generate the calendar. Enter `0` to generate a custom calendar.
Hierarchy code	Specify the hierarchy code. **Note:** For a custom calendar, you can specify a hierarchy code of up to 10 characters. **Note:** Do not include single quotation marks or double quotation marks.
Hierarchy display name	Specify the hierarchy display name. This name is displayed on the user interface when you create a plan for collaboration.

Note: You can run this job to create multiple calendars. However, ensure that you are not running the job multiple times with the same set of parameters.

4 Click **Save**, and then click **OK**. The Properties dialog box closes.

5 After the parameters are specified, run the following job: **`/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave08 (Utilities)/faw_0801_load_planning_time_dim`**

After the job is run, the tables for the calendar are created in the solution data layer (SDL) with the following name: time_dim_<hierarchy code> (for example, time_dim_custom)

6 Open the TIME_DIM_HIERARCHY_LVL table in the Config library, and provide the following information:

- in the DEFAULT_PAST_PERIODS column, provide a default value for the number of past periods
- in the DEFAULT_FUTURE_PERIODS column, provide a default value for the number of future periods

Note: The values for the number of past and future periods that you enter are shown on the user interface when you create a plan for collaboration.

Note: The granularity of the custom calendar must be at the day level, regardless of the interval. In other words, any interval of the custom calendar must start with a day. For example, suppose the interval of the custom calendar is a week. In this case, the week must start with a day.

7 Run the following job in order to update the application metadata tables: **`/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave08 (Utilities)/faw_0803_updt_application_config_tables`**

Note: After you run this job, you might receive a warning message indicating that column lengths are different. You can ignore this message.

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Adding an Alternate Hierarchy for Collaboration

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About Adding an Alternate Hierarchy for Collaboration

When you want to perform a collaboration on a hierarchy other than the default one, add an alternate hierarchy to an existing dimension. For example, suppose the PRODUCT dimension contains the default hierarchy as category, sub-category, and product name. However, to get a broad idea of demand and to perform collaboration, you can choose a hierarchy that contains the following hierarchy levels: segment, class, and product name.

Note: The leaf level of the alternate hierarchy must be same as that of the default hierarchy.

Add an Alternate Hierarchy

To add an alternate hierarchy:

1. Open the following job in the SAS Data Integration Studio workspace:

   `/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave08 (Utilities)/faw_0802_add_alternate_hierarchy`

2. Right-click in the empty area of the workspace, and select **Properties**. The Properties dialog box appears.

3. On the **Precode and Postcode** tab of the Properties dialog box, enter information for the parameters. The following table describes the parameters.

Table 13.1 Parameter Description

Parameter	Description
Dimension name	Enter the name of the dimension to which you want to add an alternate hierarchy. You must use an existing dimension that has already been configured in SAS Forecast Analyst Workbench to add an alternate hierarchy. **Note:** You can enter the name of the dimension that is in the DIM_NM column of the config.DIM_TABLE_LIST table.
Hierarchy code	Enter the code for the alternate hierarchy. The code can contain a maximum of 10 characters.
Hierarchy display name	Enter a name for the alternate hierarchy.
Hierarchy level count	Enter the number of levels that are required in the alternate hierarchy.

Note: You can run this job to create multiple hierarchies. However, ensure that you are not running the job multiple times with the same set of parameters.

4 Click **OK**.

5 Run the faw_0802_add_alternate_hierarchy job.

After the job is run, the table is created in the staging area and in the SDL with the following format: stg_<dimension name>_<alternate hierarchy name>. For example, stg_product_brand

6 Run the following job through SAS Data Integration Studio to update the UIART tables:

```
/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave08
(Utilities)/faw_0803_updt_application_config_tables
```

Note: After you run this job, you might receive a warning message indicating that column lengths are different. You can ignore this message.

7 Load the customer data into the table that is created for the additional hierarchy in the staging area.

8 Run the `Wave02` and `Wave03` jobs. For more information about these jobs, see “Running Ongoing Jobs” on page 71.

14

Extracting Data for All Stakeholders of a Plan

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About Extracting Data for All Stakeholders of a Plan

When you are performing collaboration through SAS Forecast Analyst Workbench, you can extract the data for only the default stakeholder member. If you want to perform the analysis on the data of all stakeholders, you can extract the data and analyze it in SAS Visual Analytics. You can use SAS Visual Analytics to perform advanced analytics on the data.

Extract Data for All Stakeholders of a Plan

To extract data for all stakeholders of a plan:

1 Open the following job in the SAS Data Integration Studio workspace: `/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave08 (Utilities)/faw_0806_extract_fm_data`

2 Right-click in the empty area of the workspace, and select **Properties**. The **Properties** dialog box appears.

3 On the **Properties** dialog box, click **Precode and Postcode** tab and then enter the following information.

Table 14.1 *Parameter Description*

Parameter	Description
Plan name	Enter the name of the plan for which you want to extract the data for all stakeholders for analysis.
Model code	Enter the code of the model that is created in SAS Financial Management for the plan.

4 Click **OK**.

5 Run the job.

After you run the job, a table is created in the FAW_VA library. The table is created with the following format: consensus_report_<plan_ID> (for example, consensus_report_2). You can use the data that is in this table for further analysis.

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Adding a Dimension to an Existing Plan

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About Adding a Dimension to an Existing Plan

You can add a dimension to an existing plan when you want to perform the collaboration on an additional dimension. For example, suppose Plan ABC contains the dimensions PRODUCT and CUSTOMER. Later, you want to add another dimension, QUALITY, to Plan ABC in order to rate the inputs that you obtained in collaboration.

You can add the dimension when the plan status is **Created**, **Initialized**, or **Plan closed**. After you add a dimension to an existing plan, you can continue to perform collaboration.

TIP You can add a dimension to a plan in order to perform qualitative analysis. For example, the dimension name could be QUALITY and its values could be Bad, Good, Better. Stakeholders could use these values of the newly added dimension to perform collaboration.

Adding a Dimension to an Existing Plan

You can add a dimension to an existing plan in order to perform collaboration on an additional dimension.

The following prerequisites apply:

- The status of the plan must be either **Created**, **Initialized**, or **Plan closed**.
- The dimension that you want to add must already be configured in SAS Forecast Analyst Workbench.
- The new dimension must not already exist in the plan.

To add a dimension:

1 Open the following job in the SAS Data Integration Studio workspace: `/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave08 (Utilities)/faw_0807_add_adhoc_dim`

2 Right-click in the empty area of the workspace, and click **Properties**. The **Properties** dialog box appears.

3 On the **Properties** dialog box, click the **Precode and Postcode** tab, and enter the following information.

Table 15.1 *Parameter Description*

Parameter	Description
Plan name	Enter the name of the plan for which you want to add a dimension.
Dimension name	Enter the name of the dimension that you want to add. Refer to the CONFIG.DIM_TABLE_LIST table to determine the exact name of the dimension.
Hierarchy code	Enter the hierarchy code that you want to add. You must use the existing hierarchy code. The hierarchy code can be found in the HIERARCHY_CD column of the CONFIG.DIM_HIERARCHY table.
Hierarchy level number	Enter the hierarchy level number that you want to add. You must use the existing hierarchy number for the selected hierarchy. The hierarchy level number can be found in the HIER_ORDER_NO column of the CONFIG.DIM_HIERARCHY_LVL table.

4 Click **OK**.

5 Run the job.

After the job runs, the table is created in the `Scratch` library with the following format: plan_forecast_fact<plan ID> (for example, plan_forecast_fact12).

6 Open the table in the `Scratch` library, and enter values for the newly added dimension column.

Do not add rows to the table.

7 Run the faw_0808_derive_adhoc_dim_hierarchy job that is located at the following location: `/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave08 (Utilities)`.

8 Create a template.

The existing templates are located at the following location: `SAS-configuration-directory\Lev1\AppData\SASForecastAnalystWorkbench\templates`

If you create a template, you do not have to populate the fact tables manually every time the data is loaded to the staging area. When data in the plan is

refreshed, the data in the newly added dimension is always reloaded using the logic specified in the template.

9 Provide the reference of the template in the config.consensus_plan_template_list table.

For more information, see “CONSENSUS_PLAN_TEMPLATE_LIST” on page 123.

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Adding an Independent Variable

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Overview of Adding an Independent Variable

SAS Forecast Analyst Workbench enables you to add an independent variable to your deployment considering the changes in the business requirement. You can either specify to use an already present independent variable or add an independent variable that was not previously available. For example, you can add *Fuel* as an independent variable.

After the independent variable is added, you can start using the independent variable in the forecasts. Select the newly added independent variable while creating a forecast to use it. In order to use the newly added independent variable in an existing forecast, edit the forecast and then select the independent variable.

Add an Independent Variable

To add an independent variable:

1 Open the following job in the SAS Data Integration Studio workspace:

```
/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave08
(Utilities)/faw_0812_add_independent_variable
```

2 Right-click in the empty area of the workspace, and select **Properties**. The Properties dialog box appears.

3 On the **Precode and Postcode** tab of the Properties dialog box, enter information for the following parameters.

Table 16.1 Parameter Description

Parameter	Description
INP_INDEP_VAR_NM	Enter the name of the independent variable that you want to use or that you want to add. The name of the KPI must be a valid SAS name. For more information about SAS naming conventions, see *SAS Language Reference: Concepts* at http://support.sas.com/documentation/cdl/en/lrcon/68089/HTML/default/viewer.htm.
INP_KPI_VAR_NM	Enter the variable name of the KPI to which you want to add the independent variable.
INP_INDEP_VAR_DESC	Enter the description for the independent variable. This parameter is optional.
INP_INDEP_VAR_DISPLAY_NM	Enter the name of the independent variable that you want to display on the user interface. This parameter is optional.

Note: You can run this job multiple times to add independent variables. However, ensure that you are not running the job multiple times with the same set of parameters.

4 Click **OK**.

5 Run the faw_0812_add_independent_variable job.

After the job is run, SAS Forecast Analyst Workbench checks whether the independent variable is present in the CONFIG.INDEP_VAR_TABLE table.

If the independent variable is present in the CONFIG.INDEP_VAR_TABLE table, SAS Forecast Analyst Workbench associates it with the KPI in the CONFIG.KPI_CONFIG table.

If the independent variable is not present in the CONFIG.INDEP_VAR_TABLE table, SAS Forecast Analyst Workbench creates its entry in the CONFIG.INDEP_VAR_TABLE table, and then associates it with the KPI in the CONFIG.KPI_CONFIG table.

SAS Forecast Analyst Workbench adds a column with the independent variable name in the tables that are associated with the KPI in Stage and SDL libraries. The name of the column will be the value that is specified in the inp_indep_var_nm parameter.

6 Load data to Stage area.

For more information about loading data to Stage area, see “Loading Data into the Stage Area” on page 68.

7 Run the ongoing jobs that are present in the following folders in the SAS Data Integration Studio:

- `/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave02`
- `/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave03`

For more information about running the ongoing jobs, see “Running Ongoing Jobs” on page 71.

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Adding a Key Performance Indicator

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Overview of Adding a Key Performance Indicator (KPI)

In response to the rapidly changing business requirements, you might want to reconsider your goals and predict a different key performance indicator. To accommodate these rapid changes, you can add a KPI to SAS Forecast Analyst Workbench. For example, you can add a Financial KPI to SAS Forecast Analyst Workbench in addition to the Sales and Demand KPIs. After you add the KPI, you can use it when you create a forecast in the user interface.

Add a Key Performance Indicator

To add a key performance indicator:

1 Open the following job in the SAS Data Integration Studio workspace:

```
/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave08
(Utilities)/faw_0813_add_kpi_variable
```

2 Right-click in the empty area of the workspace, and select **Properties**. The Properties dialog box appears.

3 On the **Precode and Postcode** tab of the Properties dialog box, enter the information for the following parameters.

Table 17.1 *Parameter Description*

Parameter	Description
inp_KPI_VAR_NM	Enter the variable name that is associated with the KPI. The variable name must be a valid SAS variable name. For more information about SAS naming conventions, see *SAS Language Reference: Concepts*. This is a required parameter.

Parameter	Description
inp_KPI_TYPE	Enter the type of the KPI. This is a required parameter.
inp_KPI_AGGRE_METHOD	Enter the aggregation and accumulation method to be used for the KPI. This method must be a valid method as described in *SAS Forecast Server Procedures: User's Guide*. You can change this method for different forecasts. This is a required parameter.
inp_SQL_KPI_AGGRE_METHOD	Enter the SQL procedure-related to the aggregation method. The values can be **AVG** | **MEAN**, **COUNT** | **FREQ** | **N**, **CSS**, **CV**, **MAX**, **MIN**, **NMISS**, **PRT**, **RANGE**, **STD**, **STDERR**, **SUM**, **SUMWGT**, **T**, **USS**, and **VAR**. This is a required parameter.
inp_DIM_IND	Enter the dimension RKs that are applicable to the KPI, separated by commas. For example, %let inp_DIM_IND = 1,2,3; indicates that Product, Store_location, and Customer will be used for the new KPI. This is a required parameter.
inp_KPI_NM	Enter the name of the KPI. If you do not enter the name of the KPI, SAS Forecast Analyst Workbench displays the value of the inp_KPI_VAR_NM parameter on the user interface.
inp_KPI_TABLE_NM	Enter the name of the table in which fact data that is associated with the KPI is stored. The table name must be a valid SAS data set name. If you do not enter the name of the table, SAS Forecast Analyst Workbench uses the value of the inp_KPI_VAR_NM parameter.
inp_KPI_ID	Enter the unique identifier for the KPI. If you do not enter the KPI ID, SAS Forecast Analyst Workbench uses the value of the inp_KPI_VAR_NM parameter.
inp_KPI_ADK	Enter the additional description key column name for the KPI. This column is required in order to integrate SAS Forecast Analyst Workbench with SAS Financial Management.
inp_KPI_DESC	Enter the description of the KPI.
inp_KPI_LIB	Enter the name of the library in which the KPI table that is specified in the inp_KPI_TABLE_NM parameter is stored. If you do not enter any value for this parameter, SAS Forecast Analyst Workbench writes the name of the library as **SDL**.
inp_INDEP_TABLE_NM	Enter the name of the table in which the independent variables fact data is stored. The table name must be a valid SAS data set name. This parameter is optional. If you do not want to associate the information about independent variables with the KPI, do not enter a value for this parameter.

Parameter	Description
inp_INDEP_VAR_LIST	Specify the list of the retained keys of the independent variable, separated by commas. The independent variables that are associated with these retained keys are displayed in the user interface for the KPI. For more information about the INDEP_VAR_RK column of the INDEP_VAR_TABLE configuration table for the retained key value of the independent variable, see "INDEP_VAR_TABLE" on page 94. This parameter is optional. If you do not want to associate the information about independent variables with the KPI, do not enter a value for this parameter.
inp_LIB_INDEP	Enter the name of the existing library in which the KPI table is to be created. The KPI table that will be created is specified in the inp_KPI_TABLE_NM parameter. If you do not enter any value for this parameter, SAS Forecast Analyst Workbench writes the name of the library as **SDL**. This parameter is optional. If you do not want to associate the information about independent variables with the KPI, do not enter a value for this parameter.
inp_DECIMAL_ROUND_OFF_VAL	Enter the number of digits after the decimal point to be displayed in the user interface. If you do not enter any value for this parameter, SAS Forecast Analyst Workbench assumes the value 2.
AUTO_DETECT_IND	Indicates whether SAS Forecast Analyst Workbench must generate scores for the KPI. The value `1` indicates that the scores must be generated for the KPI. The value `0` indicates that the scores are not generated for the selected KPI.

Note: You can run this job multiple times to add KPIs. However, ensure that you are not running the job multiple times with the same set of parameters.

4 Click **OK**.

5 Run the faw_0813_add_kpi_variable job.

After you run the faw_0813_add_kpi_variable job, SAS Forecast Analyst Workbench performs the following tasks:

- creates an entry of the KPI in the CONFIG.KPI_CONFIG table
- creates the following tables in Stage library: STG_<inp_KPI_TABLE_NM>, STG_<inp_KPI_TABLE_NM>_EXC, STG_<inp_INDEP_TABLE_NM>, and STG_<inp_INDEP_TABLE_NM>_EXC
- creates the following tables in the library that is specified in inp_KPI_LIB parameter: <inp_KPI_TABLE_NM>, <inp_INDEP_TABLE_NM>

  The name of the library for the <inp_INDEP_TABLE_NM> table is the value that is specified in the inp_LIB_INDEP parameter.

6 Load data to the Stage area.

For more information about loading data to the Stage area, see "Loading Data into the Stage Area" on page 68.

7 Run the ongoing jobs that are in the following folders in SAS Data Integration Studio:

- `/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave02`
- `/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave03`

For more information about running the ongoing jobs, see “Running Ongoing Jobs” on page 71.

18

Using a Custom Model

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About Using Custom Models

You can add user-defined models to the default model repository of SAS Forecast Analyst Workbench. You can use the custom model to generate the predicted values for a forecast or to predict future values for a new product.

Using a Custom Model for Forecasts

When you want to use custom models to predict the future values of a forecast, ensure that the forecast is already created.

To use custom models for forecast:

1 In the DDF_MR library, create a catalog of custom models.

   The name of the catalog must be in the following format: CustomModRep<*plan_ID*>. You can obtain the plan ID for the forecast from the UIART.PLAN_DETAILS table.

   You can create a model selection list with the name Custom_model_select in XML format by using the HPFSelect procedure. If this model selection list is not in the catalog, SAS Forecast Analyst Workbench creates a list with default options, including all models in the catalog.

2 Diagnose the forecast.

Using a Custom Model for New Product Forecasting

Writing Code for a Custom Model

You can write the code for additional models that you want to appear in the **Select model** list of the **Select Model** step in the New Products workspace. The following code is a sample of the SAS code file that you will write.

The path of the file in which you write this code must be specified in the MODEL_PATH column of the CONFIG.NPF_MODEL_LOOKUP table. You must run the following job through SAS Data Integration Studio: **`/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave01 (Initial One Time)/faw_0103_load_application_config_tables`**. For more information about the NPF_MODEL_LOOKUP table, see “NPF_MODEL_LOOKUP” on page 102. For more information about the faw_0103_load_application_config_tables job, see “Running Initial Jobs” on page 67.

The code must contain a call to the macro ddcf_npf_spec, as shown in this example.

```
%macro ddcf_profile_naive_mod(
                  /*- input Panel Series data set information  -----*/
dataset=,         /*- I - input data set                           -*/
var=,             /*- I - variable name                           -*/
byvars=,          /*- I - List of BY variable names               -*/
seriesid=_SERIES_,/*- I - series ID variable name                 -*/
cycleid=_CYCLE_,  /*- I - cycle ID variable name                  -*/
                  /*- output model predictions data set information-*/
outset=,          /*- O - output data set                         -*/

                  /*- options ------------------------------------*/
alpha=       /*- I - confidence limit size                    -*/
);
%ddcf_npf_spec;
  /*-------------------------------------------------------------*/
     /*- sort by Cycle Index                                    -*/
     /*-------------------------------------------------------------*/
         PROC SORT DATA=&dataset(KEEP=&byvars&seriesid&cycleid&var)    OUT=temp_prof_naive;
         BY &cycleid
         RUN;
     /*-------------------------------------------------------------*/
     /*- compute the NAIVE model. Run proc reg                   -*/
     /*-------------------------------------------------------------*/
         proc reg data=temp_prof_naive(rename=&var=actual) NOPRINT;
         id &byvars &seriesid
         by &cycleid
         model ACTUAL = / alpha=α
         output out= &outset P=PREDICT LCL=LOWER UCL=UPPER STDP=STD RESIDUAL=ERROR;
         run;
         quit;
         %if &SYSERR^=0 & &SYSERR ^= 4 %then %do;
            %let npf_model_status = 1;
```

```
            %goto EXIT;
        %end;
    /*-------------------------------------------------------------*/
    /*- sort by BY variable                                       -*/
    /*-------------------------------------------------------------*/
        proc sort data=&OUTSET out=&OUTSET
        by &byvars&seriesid&cycleid
        run;
       /* format the output */
        data &outset
        set &outset
        format ACTUAL  percent6.2;
        format PREDICT percent6.2;
        format LOWER   percent6.2;
        format UPPER   percent6.2;
        RUN;
  %EXIT:;
%mend ddcf_profile_naive_mod;
%ddcf_profile_naive_mod( dataset=npf.Query_panel_subset&PRODUCT_KPI_LIST_ID,
                         var=_PROFILE_,
                         byvars=&NPF_BYVARs,
                         alpha=&npf_model_alpha,
                         outset=npf.Mdl_prof_&model_id._&PRODUCT_KPI_LIST_ID
                         );
```

Input Table

The input table for the macro is NPF.QUERY_PANEL_SUBSET&<PRODUCT_KPI_LIST_ID>. This table is always present in the NPF library. The value of PRODUCT_KPI_LIST_ID is the unique identifier of the new product, which can be found in the UIART.PRODUCT_KPI_LIST table. The following table is an example of the input table.

PRODUCT_RK	_SERIES	start_dt	_CUSUM_	Demand_QTY	cycle_of_npf	_AGG_	_SHARE	_CYCLE_	SUM	_PROFILE_	_CUPCT_
5	4	1-Jan-10	1611	1611	1	123522	1.30%	1	32222	5.00%	5.00%
5	4	2-Jan-10	3225	1614	2	123649	1.30%	2	32222	5.00%	10%
5	4	3-Jan-10	4800	1575	3	123891	1.30%	3	32222	4.90%	15%

Output Table

The output table is created from the input table and the macro. The name of the output table should be in the following format:

NPF.MDL_PROF_&<MODEL_ID>_&<PRODUCT_KPI_LIST_ID>. In the name, MODEL_ID refers to the unique number for the model mentioned in this table and PRODUCT_KPI_LIST_ID is the unique identifier of the new product, which can be found in the UIART.PRODUCT_KPI_LIST table.

The following table is an example of the output of custom model table.

PRODUCT_RK	_SERIES_	_CYCLE_	actual	PREDICT	STD	LOWER	UPPER	ERROR
5	4	1	5.00%	5.00%	0.000534	4.60%	5.40%	3.39E-05
5	4	2	5.00%	5.00%	0.000456	4.70%	5.40%	-0.00026
5	4	3	4.90%	5.00%	0.000593	4.50%	5.50%	-0.00105

The first three columns also appear in the input table. The following list describes the rest of the columns:

- **PREDICT**: Predicted values
- **LOWER**: Lower confidence limit
- **UPPER**: Upper confidence limit
- **ERROR**: Error term

Code for the ddcf_npf_spec Macro

You can use the following sample code for the ddcf_npf_spec macro.

```
*------------------------------------------------------------------------
* This macro defines the byvariables, dependent variables, interval,
    cycle index, kpi, cluster specifications etc for npf flow.
*------------------------------------------------------------------------;
%macro ddcf_npf_spec;
%Global NPF_BYVARS
        NPF_NUM_BYVARS
        NPF_BYVAR1
        NPF_BYVAR2
        NPF_TIMEID
        npfinterval
        disp_cycle
        calc_cycle
        npf_kpi_var_nm
        NPF_DEPVARS
        NPF_NUM_DEPVARS
        NPF_DEPVAR1
        NPF_CURRENT_DEPVAR
        NPF_NCLUSTERS
        npf_kpi_aggre
        npf_kpi_lib
        npf_kpi_lib
        ;
*------------------------------------------------------------------------
```

```
* Specify the Time Series Data Set BY variables names
*-------------------------------------------------------------------------;
/*%let NPF_BYVARS      = Product_RK  Product_NM;*/
%let NPF_BYVARS      = Product_RK;
%let NPF_NUM_BYVARS  = 1;
%let NPF_BYVAR1      = Product_RK;
%let NPF_BYVAR2     = Product_NM;
%let NPF_TIMEID      = cycle_of_npf;
*-------------------------------------------------------------------------
* Specify the Time Series Data Set Time ID variable name
*-------------------------------------------------------------------------;
        data _null_;
            set uiart.product_kpi_list;
            where PRODUCT_KPI_LIST_ID=input("&PRODUCT_KPI_LIST_ID",best12.);
/*            where PRODUCT_RK = input("&PRODUCT_RK",best12.) and KPI_RK = input("&KPI_RK",best12.);*/
            call symputx('npfinterval',PERIODICITY);
            call symputx('disp_cycle',NO_OF_CYCLES_FOR_DISP);
/*            call symputx('calc_cycle',NO_OF_CYCLES_FOR_CALC);*/
            call symputx('NPF_NCLUSTERS',no_of_clusters);
            call symputx('KPI_RK',KPI_RK);
            call symputx('PRODUCT_RK',PRODUCT_RK);
            stop;
        run;
        %let calc_cycle=&DISP_CYCLE
         data _null_;
          set config.kpi_config;
           where kpi_rk = input("*KPI_RK",best12.);
           call symputx('npf_kpi_var_nm',kpi_Var_nm);
           call symputx ('npf_kpi_aggre',KPI_AGGRE_METHOD);
           call symputx('npf_kpi_lib',LIB_NM);
           call symputx('npf_kpi_table',KPI_TABLE_NM);
        run;
*-------------------------------------------------------------------------
* Specify the Time Series Data Set Dependent Variable names
*-------------------------------------------------------------------------;
%let NPF_DEPVARS     = &npf_kpi_var_nm ;
%let NPF_NUM_DEPVARS = 1;
%let NPF_DEPVAR1     = &npf_kpi_var_nm ;
%let NPF_CURRENT_DEPVAR = &npf_kpi_var_nm ;
**********************************************************************
* SPECIFIY QUERY SPECIFICATION - CLUSTER SPECIFICATION AND MODEL SPECIFICATION
**********************************************************************;
%ddcf_load_global_parameters;
%ddcf_npf_interval_specs;
%ddcf_set_npf_option_val;
%ddcf_npf_prod_kpi_options;
%ddcf_set_default_npf_param;
%mend ddcf_npf_spec;
/*%ddcf_npf_spec;*/
```

19

Using Custom Logic for Generating a Forecast

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About Using Custom Logic for Generating Forecasts

SAS Forecast Analyst Workbench enables you to use a logic, that suits to the business requirement, to generate the forecasted values for the time series automatically. When you phase in a relationship, SAS Forecast Analyst Workbench automatically identifies another relationship that is similar to the newly phased-in relationship, uses the logic that you specified and the forecasted values of the identified relationship, and finally generates the forecasted values for the newly phased-in relationship. In absence of the custom logic, SAS Forecast Analyst Workbench uses the default logic.

By using the custom logic, you are sure that the forecasted values that are generated for the time series are realistic and that they suit your business.

Use Custom Logic for Generating Forecasts

To use custom logic for generating forecasts:

1 Edit the `ddcf_cluster_train.sas`, `ddcf_new_product_forcast_train.sas`, and `ddcf_new_product_forecast_score.sas` files to write a logic that suits the business requirement.

   These files are present at the following location: `<SAS Home>\SASFoundation\9.4\ddcfsrv\sasmisc`

2 Edit the ETL job.

   a Open the following job in the SAS Data Integration Studio workspace:

\Products\SAS Forecast Analyst Workbench\5.3 Jobs \Wave03\faw_0304_execute_auto_detect_train job, and select **Properties**.

b Right-click in the empty area of the workspace, and select **Properties**. The Properties dialog box appears.

c On the **Precode and Postcode** tab in the Properties dialog box, enter the following statement in the **Precode** section:

```
%include "C:\Program Files\SASHome\SASFoundation
\9.4\ddcfsrv\sasmisc\ddcf_cluster_train.sas";
%include "C:\Program Files\SASHome\SASFoundation
\9.4\ddcfsrv\sasmisc\ddcf_new_product_forcast_train.sas";
```

d Click **OK** to close the Properties dialog box.

3 Run the faw_0304_execute_auto_detect_train job in the SAS Data Integration Studio.

4 Make an entry for the **<SAS Home>\SASFoundation\9.4\ddcfsrv \sasmisc\ddcf_new_product_forecast_score.sas** file in **<SAS Home> \SASFoundation\9.4\ddcfsrv\sasstp\ddcf_create_score_main.sas** file as follows:

```
%include "<SAS Home>\SASFoundation
\9.4\ddcfsrv\sasmisc\ddcf_new_product_forecast_score.sas"
```

5 Generate forecasted values for new relationships in the user interface of SAS Forecast Analyst Workbench.

In order to generate forecasted values for new relationships in the user interface, in the Product category of the Administration workspace, click .

For more information, see *SAS Forecast Analyst Workbench: User's Guide*.

20

Archiving Data for Reporting

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Overview of Archiving Data for Reporting

In the sales and operations planning process within your organization, you might want to use the output of a plan for additional processing and reporting. You can use SAS reporting products (such as SAS Visual Analytics) to obtain and deliver the information that you need, when you need it, and in the format that you need.

Generating Reports of the Forecasted Data

In order to use the forecast data for reporting, you must complete the following steps:

1 Check the location where forecasted data is generated for reporting in the GL_DDF_ARCHIVE_DIR_PATH configuration parameter. For more information about the GL_DDF_ARCHIVE_DIR_PATH parameter, see “About the Configuration Parameters” on page 35.

2 Run the following macro in SAS Data Integration Studio:

```
%ddcf_init;
%ddcf_generate_forecast_reports(plan_id=);
```

The plan_ID is the identification number of the forecast. This identification number is in the Plan_Details table, which is in the UIART library.

After the macro runs, a directory in the archive directory path named <plan_nm> is created in the location specified in the GL_DDF_ARCHIVE_DIR_PATH parameter. The following tables are created inside the directory.

Table 20.1 *Forecast-Specific Tables That Contain Forecasted Data*

Table Format	Description
PLAN_FCST_DETAILS<PLAN_ID>	Contains the complete forecast hierarchy, including the hierarchy name and forecast-related information (for example, the values for ACTUAL, PREDICTED, LCL, UCL)
PLAN_STAT_DETAILS<PLAN_ID>	Contains the complete forecast hierarchy, including the hierarchy name and statistical information (for example, the values for MAPE, RMSE, PREDICTION_APE)

SAS Forecast Analyst Workbench updates these tables with the latest forecasted data. You can use these tables to generate the reports.

Archiving Collaboration Data and Generating Reports

In order to archive the output of the plan that contains the collaboration data for additional processing, you must perform the following steps:

1 Set the GL_INCLUDE_ARCHIVE_IND configuration parameter to `1`. For more information about the GL_INCLUDE_ARCHIVE_IND parameter, see "About the Configuration Parameters" on page 35.

   Note: You must restart the object spawner for the changes to take effect.

2 Check the location where data will be archived in the GL_DDF_ARCHIVE_DIR_PATH configuration parameter.

3 Perform collaboration on a plan and complete it.

   After collaboration is completed, the status becomes **Plan closed**.

SAS Forecast Analyst Workbench creates a folder with the name **`archive`** if that folder is not already present. SAS Forecast Analyst Workbench also creates a folder named **`<plan name>`** inside the archive folder and saves the data inside it. SAS Forecast Analyst Workbench saves the plan-specific dimension data in a data set with a name in the following format: plan_dim<n>_<cycle_number> . The forecast data is stored in a data set with a name in the following format: plan_forecast_fact<n>_<cycle_number>. The cycle number is incremental and changes as you perform multiple collaboration cycles on the plan.

21

Seeding Analysis Variables

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Overview of Seeding

Seeding is the process of pre-populating a slice of the data so that initial values are available during the collaboration process. The following default analysis variables are available during the collaboration planning process: actual, predicted, consensus, and override. Based on your business requirements, you can seed consensus and override analysis variables, and any other custom-defined analysis variable before you initiate the collaboration planning process.

Performing Seeding

After the configuration FAW ETL jobs are run, the following configuration tables are created:

- ANALYSIS_VAR
- ANALYSIS_VAR_X_LOAD_TYPE
- LOAD_TYPE

The ANALYSIS_VAR table contains the list of default analysis variables. You can add more analysis variables depending on your business needs. For more information about the ANALYSIS_VAR table, see “ANALYSIS_VAR” on page 120.

The ANALYSIS_VAR_X_LOAD_TYPE table contains information about the applicability of seeding macros for each analysis variable. For more information about the ANALYSIS_VAR_X_LOAD_TYPE table, see “ANALYSIS_VAR_X_LOAD_TYPE” on page 122.

The LOAD_TYPE table contains the default seeding macros and the display name for each macro. You can add more macros to meet you business requirements. For more information about the LOAD_TYPE table, see “LOAD_TYPE” on page 123.

The information in the LOAD_TYPE_DISP_NAME column is displayed in the **Load Condition** list in the Select Variables dialog box in the **Configure Analysis Variable** process box in the Collaboration Flow view of the user interface. For more information, see *SAS Forecast Analyst Workbench: User's Guide*.

In addition to the default macros, you can write more macros and then update these configuration tables to seed the analysis variables according to your business requirements.

Adding the analysis variables is a one-time activity, and it should be performed immediately after you deploy SAS Forecast Analyst Workbench. However, if you add an analysis variable for performing collaboration after you have started using SAS Forecast Analyst Workbench, you must run the ETL jobs in the following sequence in order to use the newly added analysis variable:

1. /Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave03
2. /Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave06 (FM Integration - Data Loading)

Writing a Macro for Seeding

Default analysis variables (such as CONSENSUS) and user-defined analysis variables do not contain a default set of values. You can use seeding to provide default values for these variables.

SAS Forecast Analyst Workbench provides sample templates for seeding at the following location: **`SAS-configuration-directory\Levn\AppData\SASForecastAnalystWorkbench\templates`**.

Note: When you are using one of the templates, change the extension of the template from .sas.template to .sas.

You can provide your own templates for seeding by creating an entry for them in the LOAD_TYPE table in the configuration library. For more information about the LOAD_TYPE table, see “LOAD_TYPE” on page 123.

The following examples describe the templates.

Seeding Template Example 1: Predicted values are seeded in the analysis variable

The following formula is applicable for this template: Analysis Variable = Predicted

Seeding Template Example 2: Future Predicted values are seeded in the analysis variable

The following formula is applicable for this template: Analysis Variable = Predicted after the date specified by GL_FORECAST_DATE

Implementation consultants customize the default templates to meet your business requirements. The format of the templates is predefined. For more information, see the sample templates provided.

The SCRATCH.seeding_input**`<PLAN_ID>_<ANALYSIS_VAR>`** table is used as input for seeding.

The sample code for the template is designed in such a way that the scratch.seeding_output`<PLAN_ID>_<ANALYSIS_VAR>` output table is generated. The scratch.seeding_output`<PLAN_ID>_<ANALYSIS_VAR>` output table contains the dimension key columns of the SCRATCH.SEEDING_INPUT`<PLAN_ID>_<ANALYSIS_VAR>` table and the seeded ANALYSIS variables.

The following table is the sample SEEDING_INPUT_`<PLAN_ID>_<ANALYSIS_VAR>` table.

Table 21.1 *Sample SEEDING_INPUT_<PLAN_ID>_<Analysis_Var> Table*

PRODUCT_LVL_RK3	STORE_LOCATION_LVL_RK2	CAL_MTH_SK	FCST_DATE	OVERRIDE	CONSENSUS
1004	1002	121	01Jan10	126497	126497
1004	1002	122	01Feb10	130673.4	130673.4
1004	1002	123	01Mar10	126407.2	126407.2
1004	1002	124	01Apr10	130903	130903
1004	1002	125	01May10	132834.9	132834.9

This table is merged with the PLAN_FORECAST_FACT_`<PLAN_ID>` table by using key columns. After the tables are merged, the analysis variables of the fact table are seeded as per your business requirements, and the PLAN_FORECAST_FACT_`<PLAN_ID>` table is available in the PLANEXPL library.

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Working with Product Life Cycle Data

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Overview

In the sales and operations planning process within your organization, you might want to use the existing information about the product life cycle of your products, such as the phase-in and phase-out dates of a product, its relationships, its successor product, and so on. Instead of defining the life cycle information for each product individually through the user interface of SAS Forecast Analyst Workbench, you can load the data for all products in a group using ETL jobs.

Similarly, you can export the existing product life cycle data from the user interface (in other words, data that is in the UIART) of SAS Forecast Analyst Workbench to the Scratch library in order to use that data for further processing.

Note: Do not change the data or the structure of the UIART data sets manually. Use ETL jobs to load or export the product life cycle data.

Load Product Life Cycle Data Into SAS Forecast Analyst Workbench

Loading of product life cycle data into SAS Forecast Analyst Workbench is a one-time activity.

In order to load the product life cycle data into SAS Forecast Analyst Workbench, perform the following steps:

1. Ensure that you have run the following ETL job: `/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave01 (Initial One Time)/faw_0101_generate_datamart`
2. Ensure that the GL_FAW_BL_PSQL_PATH configuration parameter contains correct full path to the PSQL executable file of the PostgreSQL database.
3. Load the following Stage data sets with your product life cycle data:

- STG_PHASE_IN_PHASE_OUT_DTLS
- STG_SUCCESSOR_RLTN_DTLS

For more information about Stage tables, see *SAS Forecast Analyst Workbench 5.3: Data Reference Guide*.

4 Run the following ETL job in order to load the product life cycle data from the Stage area to the solution data layer (SDL): **`/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave08 (Utilities)/faw_0809_plc_load_stage_to_sdl`**

5 Run the following ETL job in order to load the product life cycle data from the SDL to the UIART: **`/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave08 (Utilities)/faw_0810_plc_load_sdl_to_uiart`**

Export Product Life Cycle Data from SAS Forecast Analyst Workbench

You can export the product life cycle data from UIART of SAS Forecast Analyst Workbench to the Scratch library.

To export the product life cycle data, run the **`/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave08 (Utilities)/faw_0811_plc_export_uiart_to_scratch`** job in SAS Data Integration Studio.

SAS Forecast Analyst Workbench creates and loads the following tables in the Scratch library:

- STG_PHASE_IN_PHASE_OUT_DTLS
- STG_SUCCESSOR_RLTN_DTLS

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Performing Custom Analyses

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Overview of Custom Analysis

SAS Forecast Analyst Workbench enables SAS consultants and analysts to write SAS Stored Processes as custom analyses. You can use the custom analyses to improve the quality of the forecast or want to use custom methods of forecasting that suit the business requirement. You can use the predicted values that are generated from custom analyses in the downward processes of supply-chain management. You can integrate the output of custom analysis with SAS Collaboration Planning Workbench for collaboration planning and with SAS Inventory Optimization Workbench for optimizing the inventory.

Perform Custom Analysis

Steps of Performing Custom Analysis

1 Perform one of the following actions:

- Use out-of-the-box analysis, three-stage modeling analysis.

  For more information about using three-stage modeling analysis, see *SAS Forecast Analyst Workbench: User's Guide*.

- Develop an analysis that suit your business requirement.

  1 Write code that suits the business requirement and then save the SAS Stored Process.

    For more information, see "Write SAS Stored Process" on page 174.

2 Register the SAS Stored Process in SAS Management Console.

For more information, see “Register the SAS Stored Process” on page 176.

2 On the user interface of SAS Forecast Analyst Workbench, perform custom analysis.

For more information, see “Perform Custom Analysis” on page 177.

3 Use the output of custom analysis in the downward processes of supply-chain management, such as collaboration planning and integrating with SAS Inventory Optimization Workbench.

For more information, see “Use Custom Analysis Output in the Downward Processes of Supply-Chain Management” on page 178

Write SAS Stored Process

You write the SAS Stored Process to run an analysis that suits the business requirement. The analysis is run on the forecast. In other words, the forecast acts as an input to the custom analysis.

You can perform the analysis on SAS 9.4 and SAS Viya. In other words, you can either use SAS 9.4 to run the analysis and generate output. Or, you can upload the data from SAS 9.4 to SAS Viya, execute the analysis in SAS Viya, and download the output in SAS 9.4. You can choose the option of using SAS 9.4 or SAS Viya that is present in the template and then write code accordingly.

Use the following guidelines to write SAS Stored Process:

1 Make a copy of the ***SASHome*\SASFoundation\9.4\ddcfsrv\sasstp\ddcf_ca_stp_template.sas** template file at the same location and rename it.

2 In the file, ensure that the following macro is present.

```
%macro ddcf_ca_stp_template;
```

The macro obtains information about parameters that are related to the selected forecast. The information about these parameters is obtained from uiart.plan_details and config.kpi_config tables. The parameters include plan_nm, plan_kpi, plan_history_period, interval, plan_no_of_fcst_period,kpi_lib, kpi_table, kpi_Aggregation_metod and so on.

The macro also assigns libraries for each level in the forecast hierarchy. For example, if the forecast hierarchy string is "STORE_LOCATION_RK PRODUCT_LVL_RK5 PRODUCT_RK", then libnames _hpf0, _hpf1 and _hpf2 are assigned to the folders STORE_LOCATION_RK, PRODUCT_LVL_RK5, and PRODUCT_RK respectively.

The macro also retrieves prj_def_no which is a unique project definition number for the analysis project. You use the prj_def_no name in downward processes of supply-chain management.

3 Write code to create input data set for custom analysis.

4 (Optional) Perform the following steps when you are using SAS Viya.

a Ensure that the following statement is present.

```
%ddcf_viya_parameters;
```

The %ddcf_viya_parameters; statement retrieves connection information (such as host and port) to connect to a SAS Viya server.

b Ensure that the following statement is present.

```
%ddcf_viya_signon;
```

The %ddcf_viya_signon; statement logs on to SAS Viya.

c Apart from the below mentioned macro variables, write code to copy other required macro variables (for example, interval) from the SAS 9.4 server to the SAS Viya server.

```
%syslput plan_id =&plan_id / remote = rhost;
    %syslput gl_faw_viya_machine =&gl_faw_viya_machine / remote = rhost;
    %syslput gl_viya_casport =&gl_viya_casport / remote = rhost;
```

d Ensure that the following statement is present.

```
rsubmit ;
```

e Ensure that the following statement that creates the SAS Cloud Analytic Services server library is present:

```
libname fawcas CAS  host = "&gl_faw_viya_machine"
port = &gl_viya_casport. datalimit=ALL;
```

Note: When SAS Viya and CAS are deployed on different machines, specify the machine name of the CAS server control node for the host= argument in the CAS LIBNAME statement. Do not change the value of this argument when SAS Viya and CAS are deployed on the same machine.

f Specify the name of the data sets to upload input data from SAS 9.4 to SAS Viya server:

5 Write code for custom analysis to generate results.

6 (Optional) Perform the following steps when you are using SAS Viya.

a Specify the data sets to download results from SAS Viya to SAS 9.4.

b Ensure that the following statements are present.

```
endrsubmit;
signoff rhost;
```

7 Ensure that the following statements are present.

```
%let leaf_lvl=%eval(&hierarchy_count_original. - 1);
%ddcf_validate_ca_output(data=_hpf&leaf_lvl. .ca_outfor_&prj_def_no.);
```

You can use the custom analysis output in the downstream processes such as collaboration plan and integrating with SAS Inventory Optimization Workbench.

When you want to use the output of custom analysis for collaboration planning or for integrating with SAS Inventory Optimization Workbench, the name of the output dataset must be in the following format: ca_outfor_&prj_def_no.

Furthermore, the ca_outfor_&prj_def_no dataset must contain the following columns:

- By variables in the complete hierarchy string
- START_DT
- ACTUAL
- PREDICT
- UPPER
- LOWER
- ERROR
- STD

8 Ensure that the following statements are present and then write code at the specified location to display output in the Analysis workspace in the user interface of SAS Forecast Analyst Workbench.

```
%STPBEGIN;
 ods html file="&resultHTML";
/*************************************************************/
Write code to display output in the Analysis workspace. */
/*************************************************************/
 ods html close;
%STPEND;
%mend;
```

The %STPBEGIN and %STPEND macros provide standardized functionality for generating and delivering output from a stored process.

The ods html statement opens, manages, and closes the HTML destination, that produces HTML output.

9 Except for the %ddcf_ca_stp_template; statement, do not make any changes to the rest of the statements that are found at the end of the code.

```
%ddcf_init;
%ddcf_capture_log(logprefix=custom_analysis_&projectID.,log_id=&plan_id.);
%ddcf_ca_stp_template;
%ddcf_reset_log;
```

10 Ensure that the name of the %ddcf_ca_stp_template; macro is same throughout the template.

Register the SAS Stored Process

You must register the SAS Stored Process that you wrote in order to use it for performing custom analysis.

To register the SAS stored process:

1 Log on to SAS Management Console as a administrative user who can register the SAS stored process.

2 In the **Folders** tab, go to `/Products/SAS Forecast Analyst Workbench/5.3 Custom Analysis/Custom Analysis` location and then copy the `Template` folder at the same location.

3 (Optional) Right-click the newly copied folder and select **Rename**.

4 (Optional) In the **Rename** dialog box, type a new name for the folder and then click **OK**.

The name of the folder is displayed on the user interface of SAS Forecast Analyst Workbench.

5 Right-click the `Template` stored process in the newly added folder and select **Properties**.

Note: Do not make any changes to the `Obtain Available Forecasts` stored process. The `Obtain Available Forecasts` stored process finds the forecasts that are authorized to the user. Furthermore, the stored process finds the forecasts that are in the **Created**, **Forecasted**, and **Accepted** state on the user interface so that the analyst can select the required forecast.

6 (Optional) In the **General** tab of the Properties dialog box, type a name and description for the stored process.

7 In the **Execution** tab of the Properties dialog box, perform the following actions:

- Ensure that the path in the **Source code repository** field is correct. The path on a Microsoft Windows environment is `SASHome\SASFoundation\9.4\ddcfsrv\sasstp`. The path on a AIX or Linux environment is `SASHome/SASFoundation/9.4/sasstp/ddcfsrv`.
- Ensure that the correct SAS Stored Process file name is mentioned in the **Source file** field.

8 In the **Parameters** tab of the Properties dialog box, perform the following actions:

- Do not change default parameters (that include `Forecast` and `ca_hiddenPrompts`).
- Click **New Prompt** button to add new parameters that suit your business requirement.

  You can use the parameters (that are present in the **Parameters** tab) in the SAS Stored Process to perform custom analysis.

  For more information about adding parameters, see help for SAS Management Console that is accessible within the product.

9 Click **OK**.

Perform Custom Analysis

On the user interface of SAS Forecast Analyst Workbench, go to the Analysis workspace, and then perform custom analysis. You can perform the custom analysis based on the SAS Stored Process that you registered in the previous step. For more information about performing custom analysis, see *SAS Forecast Analyst Workbench: User's Guide*.

Use Custom Analysis Output in the Downward Processes of Supply-Chain Management

You can use the output of custom analysis in the downward processes of supply-chain management, such as collaboration planning and integrating with SAS Inventory Optimization Workbench.

The collaboration planning enables you to explore the output of custom analysis and then obtain recommendations and guidance of various stakeholders on the output of custom analysis. For more information, see *SAS Forecast Analyst Workbench: User's Guide*.

The output of custom analysis can be integrated with SAS Inventory Optimization Workbench to optimize the inventory. You can use the demand that is obtained from custom analysis to optimize the inventory levels, service levels, and also to plan promotions. For more information, see *SAS Inventory Optimization Workbench: Administrator's Guide*.

24

Disaggregating Predicted Values

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Introduction to Disaggregating Predicted Values

As a SAS consultant and analyst, you understand that the predicted values (of a dimension in a forecast or of a dimension in a collaboration plan) that are disaggregated with the default methods of SAS Forecast Analyst Workbench are not satisfactory. In such case, you might want to write code for custom disaggregation methods.

You can write custom code that suits the business requirement to disaggregate the predicted values of a dimension hierarchy from a higher level to a lower level. Similarly, you might also want to write a custom code to disaggregate the predicted values from any time grain to DAY level.

Steps to Disaggregate Predicted Values

Use the following steps to disaggregate the predicted values:

1 Ensure that the disaggregated predicted values of a dimension in a forecast or in a collaboration plan are not satisfactory and that the disaggregation method must be modified or customized.

2 Perform one of the following actions:

- If you want to write code to disaggregate predicted values of a dimension from a higher level to a lower level, open the ***SASHome*\SASFoundation\9.4\ddcfsrv\sasmisc\ddcf_dimension_disaggregation.sas** file.
- If you want to write code to disaggregate the predicted values from any time grain to DAY level, open the ***SASHome*\SASFoundation\9.4\ddcfsrv\sasmisc\ddcf_time_disaggregation.sas** file.

Note: Take backup of the **ddcf_dimension_disaggregation.sas** and **ddcf_time_disaggregation.sas** files before you open them.

3 Write code that suits the business requirement and then close the file.

For more information about writing code to disaggregate predicted values of a dimension, see "Disaggregate Predicted Values of a Dimension" on page 180.

For more information about writing code to disaggregate predicted values at DAY level, see "Disaggregate Predicted Values at DAY Level" on page 183.

4 Create the forecast and collaboration plan (if required) so that the newly written disaggregation code is used and then perform required tasks in SAS Forecast Analyst Workbench.

Disaggregate Predicted Values of a Dimension

About Disaggregating Predicted Values of a Dimension

You can disaggregate predicted values of a dimension from a higher level to a lower level. The ***SASHome*\SASFoundation\9.4\ddcfsrv\sasmisc\ddcf_dimension_disaggregation.sas** file contains code for SUM and AVERAGE methods that disaggregate the predicted values. Furthermore, you can write code for other disaggregation methods that suit the business requirement. However, the code must adhere to the guidelines that are mentioned in this chapter.

The aggregated level is a lowest level in the hierarchy for which the actual and predicted values are available. The disaggregated level is a level below aggregated level in the hierarchy for which the predicted values are calculated.

If the KPI aggregation method is other than SUM and AVERAGE and you do not write any code, the code written for SUM method is used by default. The dimension disaggregation is used when you are working with forecasts and collaboration plans in SAS Forecast Analyst Workbench.

When you disaggregate the predicted values of a dimension in the context of a forecast, the predicted values are disaggregated to the immediate child node of the forecast leaf level node. For example, suppose the PRODUCT dimension in a forecast contains CATEGORY, SUBCATEGORY, and PRODUCT hierarchy levels and CATEGORY is the forecast leaf level. In this case, the predicted values for PRODUCT dimension are disaggregated from CATEGORY level to SUBCATEGORY level and so on.

When you disaggregate the predicted values of a dimension in the context of a collaboration plan, the predicted values are disaggregated to the lowest-level leaf node in the hierarchy.

Input Parameters Used for Disaggregating Predicted Values of a Dimension

The ***SASHome*\SASFoundation\9.4\ddcfsrv\sasmisc\ddcf_dimension_disaggregation.sas** file contains input parameters. These input parameters must contain values for disaggregating predicted values from a higher level of a dimension hierarchy to a lower level.

The following table contains input parameters and their description.

Table 24.1 *Details of Input Parameters*

Input Parameter	Description
plan_id	Unique ID of the forecast.
i_disagg_actuals_tab	The table name that contains the actual values at disaggregated level.
i_agg_actuals_tab	The table name that contains the actual values at aggregated level.
i_agg_predict_tab	The table name that contains predicted values at aggregated level.
o_disagg_predict_tab	The table name that contains predicted values at disaggregated level.
o_disagg_proportion_tab	The name of the output table that contains information of proportions. The disaggregation of the predicted values happens based on the proportions mentioned in this table.
plan_kpi_aggregation_method	The aggregation method of the key performance indicator. For example, TOTAL, AVERAGE.
kpi_var_nm	The name of the column in the i_disagg_actuals_tab table that contains the actual values of KPI at disaggregated level.
agg_lvl_count	The number of the hierarchy levels at aggregated level.
disagg_lvl_count	The number of the hierarchy levels at disaggregated level.
agg_hier_lvls_comma	The comma separated list of hierarchy levels at aggregated level.
disagg_hier_lvls_comma	The comma separated list of hierarchy levels at disaggregated level.
var_nm_of_actuals	The name of the column that contains actual value.

Input Parameter	Description
var_nm_of_predicts	The name of the column in the output table that contains the predicted values at disaggregated level.
allow_negative_ind	Indicates whether negative values are allowed for key performance indicator.

Guidelines for Writing Code for Disaggregation

Use the following guidelines to write code for disaggregating predicted values of a dimension from a higher level to a lower level:

- The o_disagg_predict_tab output table must contain predicted values at disaggregated level.
- The time series that are present in the table that is mentioned in the i_disagg_actuals_tab parameter must be present in the table that is mentioned in the o_disagg_predict_tab parameter.
- The name of the output table must be same as that of the value that is mentioned in the o_disagg_predict_tab parameter.
- The o_disagg_predict_tab output table must contain separate columns for each value that is present in the disagg_hier_lvls_comma input parameter.

  For example, suppose the disagg_hier_lvls_comma input parameter contains product_rk and store_location_rk values. In this case, the output table must contain two columns and their names must be product_rk and store_location_rk.
- The o_disagg_proportion_tab table must contain separate columns for each value that is present in the disagg_hier_lvls_comma input parameter.

  For example, suppose the disagg_hier_lvls_comma input parameter contains product_rk and store_location_rk values. In this case, the output table must contain two columns and their names must be product_rk and store_location_rk.
- The o_disagg_proportion_tab table must contain fraction_kpi_value column in order to have the information about proportions.
- The predicted values must be present in one of the columns in the table that is mentioned in the o_disagg_predict_tab parameter. Furthermore, the name of the column must be a value of var_nm_of_predicts input parameter.
- The date values in the table that is mentioned in the o_disagg_predict_tab parameter must be present in a start_dt column.

Disaggregate Predicted Values at DAY Level

About Disaggregating Predicted Values at DAY Level

You can use the existing methods to disaggregate the predicted values at DAY level. Additionally, you can also write code that suits the business requirement. However, the code must adhere to the guidelines that are mentioned in this chapter.

The time disaggregation is used in various modules (such as collaboration planning, auto-detect integration with forecast, promoting a new product forecasting project in order to integrate with a forecast) in SAS Forecast Analyst Workbench.

Input Parameters Used for Disaggregating Predicted Values at DAY Level

The ***SASHome*\SASFoundation\9.4\ddcfsrv\sasmisc \ddcf_time_disaggregation.sas** file contains input parameters. These input parameters must contain values for disaggregating predicted values at DAY level.

The following table contains input parameters and their description.

Table 24.2 *Details of Input Parameters*

Input Parameter	Description
input_tab	The table name that contains predicted values that you want to disaggregate.
output_tab	The table name that contains the disaggregated predicted values at DAY level.
from_interval	The time interval that is to be disaggregated. For example, write *"WEEK"* when you want to disaggregate the predicted values from WEEK level to DAY level.
plan_kpi_aggregation_method	The aggregation method of the key performance indicator. For example, TOTAL, AVERAGE.
by_var	The name of the columns in the input table for which separate analyses on observations in groups defined by those variables are required to be obtained.
target_var	The name of the column in the input table. The predicted values in this column are disaggregated at DAY level.

Input Parameter	Description
id_var	The name of the numeric column that identifies observations in the input and output data sets. The ID variable's values are assumed to be SAS date or datetime values. For example start_date.
allow_negative_ind	Indicates whether negative values are allowed for key performance indicator.

Guidelines for Writing Code for Disaggregation

Use the following guidelines to write code for disaggregating predicted values at DAY level:

- The output table must contain predicted values at DAY level.
- All time series that were present in the input table must also be present in the output table.
- The name of the output table must be same as that of the value of the output_tab parameter.
- The output table must contain separate columns for each value that is present in the by_var input parameter.

  For example, suppose that the by_var input parameter contains product_rk, and store_location_rk values. In this case, the output table must contain two columns and their names must be product_rk, and store_location_rk.
- The predicted values in the output table must be present in a column whose name must be a value of target_var input parameter.
- The output table must contain separate column for value that is present in the id_var input parameter.

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Creating and Diagnosing a Forecast Using a Background Process

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Overview of Creating and Diagnosing a Forecast Using a Background Process

You can enter the required information in the configuration tables, and then create and diagnose a forecast by running an ETL job. You can achieve the following benefits by creating and diagnosing a forecast by using a background process:

- You do not have to select many values for hierarchical members in the user interface of SAS Forecast Analyst Workbench while you are creating a forecast.
- You can enter the configuration information once in the configuration tables, and then create multiple forecasts that use the same configuration information but that have different hierarchal values.

When you create and diagnose a forecast using a background process, you cannot perform the following tasks:

- create a forecast that contains only leaf-level nodes
- select only a few leaf-level nodes in the forecast

  Using the background process, you can create a forecast that contains hierarchies with all leaf-level nodes. In order to include specific or only a few leaf-level nodes in the forecast, you must edit the forecast in the user interface and remove the unwanted leaf-level nodes.

- include the bill of material-related information

  In order to include the bill of material-related information in the forecast, you must edit the forecast in the user interface and include the bill of material-related information in it.

Create and Diagnose a Forecast Using a Background Process

In order to use the background process, you must be a part of the Forecast Analyst Process Administrator Users group in SAS Management Console.

To create and diagnose the forecast:

1. Give the Forecast Analyst Process Administrator Users group ReadMetadata permission to the **ForecastPlan** folder in the smart objects in SAS Management Console:

   a. Log on to SAS Management Console as an unrestricted administrator or as a user who has the capability to assign permissions.

   b. On the **Folders** tab, select **SAS Folders** ▸ **Products** ▸ **SAS Forecast Analyst Workbench** ▸ **5.3 Smart Objects** ▸ **ForecastPlan**.

   c. Right-click **ForecastPlan** and select **Properties**. The ForecastPlan Properties dialog box appears.

   d. On the **Authorization** tab, select the Forecast Analyst Process Administrator Users group to which you want to provide the permission in the **Users and Groups** section.

   e. In the **Effective Permissions** section of the ForecastPlan Properties dialog box, select the grant permission check box for ReadMetadata.

   f. Click **OK**.

2. Log on to SAS Data Integration Studio, and then run the `/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave12 (Create and Diagnose Forecast from Back-End)/faw_1201_create_config_tables_for_forecast` ETL job.

   The ETL job creates the following configuration tables:

   - CONFIG.BATCH_PLAN_HIERARCHY_CONFIG
   - CONFIG.BATCH_PLAN_KPI_CONFIG
   - CONFIG.BATCH_PLAN_INDEP_CONFIG
   - CONFIG.BATCH_PLAN_EVENT_CONFIG
   - CONFIG.BATCH_PLAN_ATTRIBUTE_CONFIG

3. Enter information in the newly created configuration tables.

   For more information about these configuration tables, see “Configuration Tables Required for Creating and Diagnosing a Forecast Using a Background Process” on page 188.

4 In SAS Data Integration Studio, open the **/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave12 (Create and Diagnose Forecast from Back-End)/faw_1202_create_and_diagnose_forecast** job, right-click it, and then select **Properties**.

5 On the **Code** tab in the Properties dialog box, enter information for the following parameters.

Table 25.1 *Parameters and Their Description*

Parameter	Description
configuration_template_nm	Name of the configuration template for which you want to create the forecast. SAS Forecast Analyst Workbench uses the information that you entered in the following configuration tables for the configuration template name to create the forecast: ■ CONFIG.BATCH_PLAN_HIERARCHY_CONFIG ■ CONFIG.BATCH_PLAN_KPI_CONFIG ■ CONFIG.BATCH_PLAN_INDEP_CONFIG ■ CONFIG.BATCH_PLAN_EVENT_CONFIG ■ CONFIG.BATCH_PLAN_ATTRIBUTE_CONFIG
plannm	Name of the forecast that you are creating.
plandesc	Description of the forecast.
input_member_tab	The name of the member table. You can create the member table in any library and enter its name in this parameter. For example, enter CONFIG.MEMBER_TABLE1. The member table must contain the FAW_DIM_DISPLAY_NM, and MEMBER_NM columns that are of the type Char (40). SAS Forecast Analyst Workbench uses the information that is provided in this table to create the forecast. You can enter the name that is specified in the DIM_DISPLAY_NM column in the CONFIG.DIM_TABLE_LIST table or the name for this dimension that is currently displayed in the user interface of SAS Forecast Analyst Workbench. The MEMBER_NM column contains the name of the dimension member. Enter information for the dimension member for which the INPUT_DATA_IND column in the CONFIG.BATCH_PLAN_HIERARCHY_CONFIG table contains **1**. If the forecast that you are creating contains more than one dimension, enter information about each dimension member in this table in separate rows.
created_for	Name of the user for which you want to create a forecast.
admin_ind	Enter `1` if you are creating the forecast for an administrator. Otherwise, enter `0`.
forecast_ind	Enter `1` if you want to diagnose the forecast immediately after it is created. Otherwise, enter `0`.

6 Run the **/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave12 (Create and Diagnose Forecast from Back-End)/faw_1202_create_and_diagnose_forecast** job.

Note: For more information about possible errors and warnings, refer to the logs at the following location: ***SAS-configuration-directory*\Levn\AppData\SASForecastAnalystWorkbench\logs\batch_plan_YYYYMMDD**.

The ETL job uses the information that is specified in the configuration tables and in the job parameters, and creates the forecast. After the forecast is created, you can perform further processes and tasks on the forecast in the user interface of SAS Forecast Analyst Workbench.

Configuration Tables Required for Creating and Diagnosing a Forecast Using a Background Process

BATCH_PLAN_ATTRIBUTE_CONFIG

The BATCH_PLAN_ATTRIBUTE_CONFIG table is an optional table that contains information related to attributes. Enter information in this table only when you want to use information about attributes (including common attributes and product-specific attributes) to create the forecast. Each row in this table corresponds to one attribute of a dimension.

Enter information in each column based on your business requirements. The information that you enter for each column is used to create a forecast when you run the **/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave12 (Create and Diagnose Forecast from Back-End)/faw_1202_create_and_diagnose_forecast** job in SAS Data Integration Studio.

Table 25.2 *Description of the BATCH_PLAN_ATTRIBUTE_CONFIG Table*

Column Name	Description	Data Type	Editable?	Sample Value
CONFIGURATION_TEMPLATE_NM	A unique name that identifies configuration information for each forecast. Use the same configuration template name in the following tables to enter information about a forecast: ■ BATCH_PLAN_HIERARCHY_CONFIG ■ BATCH_PLAN_KPI_CONFIG ■ BATCH_PLAN_INDEP_CONFIG ■ BATCH_PLAN_EVENT_CONFIG An administrator can create multiple forecasts by using one configuration template name.	Char (32)	Yes	Demand_2018Q1

Column Name	Description	Data Type	Editable?	Sample Value
FAW_DIM_DISPLAY_NM	Display name of the dimension for which attributes are to be selected. You can enter the name that is specified in the DIM_DISPLAY_NM column in the CONFIG.DIM_TABLE_LIST table or the name for this dimension that is currently displayed in the user interface of SAS Forecast Analyst Workbench.	Char (40)	Yes	PRODUCT
FAW_HIER_LVL_DISPLAY_NM	Display name of a hierarchy level in the dimension. You can enter the name that is specified in the DISPLAY_NM column in the CONFIG.DIM_VAR_DISP_LIST table or the name for this hierarchy that is currently displayed in the user interface of SAS Forecast Analyst Workbench. The hierarchy level that you specify in this column must exist in the BATCH_PLAN_HIERARCHY_CONFIG table.	Char (40)	Yes	Category
MEMBER_NM	Name of the dimension member for which the attributes are to be selected. You must specify the name of the dimension that is to be shown in the user interface.	Char (40)	Yes	Digital_Camera
ATTRIB_NM	Name of the dimension attribute. You can enter the name that is specified in the ATTRIB_NM column in the CONFIG.DIM_ATTRB table or the name for this attribute that is currently displayed in the user interface of SAS Forecast Analyst Workbench.	Char (80)	Yes	Life Cycle Stage
ATTRIB_VALUE	Value of the dimension attribute. When the attribute type is Range, the upper and lower limit of the range must be separated by a comma. If the attribute contains multiple values, separate the values with a comma.	Char (255)	Yes	Mature
OPERATION	If the attribute type is range, this value must be `between`. This column must be blank if the attribute type is not Range.	Number	Yes	between
COMMON_ATTRIB_IND	Enter `1` if the attribute is a common attribute. Enter `0` if the attribute is a product-specific attribute.	Number	Yes	1

BATCH_PLAN_EVENT_CONFIG

The BATCH_PLAN_EVENT_CONFIG table is an optional table that contains information related to events. Enter information in this table only when you want to include the events in the forecast. Each row in this table corresponds to one event.

Enter information in each column based on your business requirements. The information that you enter for each column is used to create a forecast when you run the `/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave12 (Create and Diagnose Forecast from Back-End)/faw_1202_create_and_diagnose_forecast` job in SAS Data Integration Studio.

Table 25.3 *Description of the BATCH_PLAN_EVENT_CONFIG Table*

Column Name	Description	Data Type	Editable?	Sample Value
CONFIGURATION_TEMPLATE_NM	A unique name that identifies configuration information for each forecast. Use the same configuration template name in the following tables to enter information about a forecast: ■ BATCH_PLAN_HIERARCHY_CONFIG ■ BATCH_PLAN_KPI_CONFIG ■ BATCH_PLAN_INDEP_CONFIG ■ CONFIG.BATCH_PLAN_ATTRIBUTE_CONFIG An administrator can create multiple forecasts by using one configuration template name.	Char (32)	Yes	Demand_2018Q1
FAW_EVENT_ID	Enter the display name for the event. You can enter the name that is specified in the _NAME_ column in the CONFIG.EVENT_REQUIRED table or the name for this event that is currently displayed in the user interface of SAS Forecast Analyst Workbench.	Char (40)	Yes	XMAS2018
FAW_EVENT_USAGE	Specify when this event is to be used. Possible values are: ■ `1`: Do not use ■ `2`: Force use ■ `3`: Try to use ■ `4`: Use if significant	Number	Yes	1

BATCH_PLAN_HIERARCHY_CONFIG

The BATCH_PLAN_HIERARCHY_CONFIG table contains information related to hierarchies. You must enter information in this table for each configuration template.

Enter information in each column based on your business requirements. The information that you enter for each column is used in to create a forecast when you run the **`/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave12 (Create and Diagnose Forecast from Back-End)/faw_1202_create_and_diagnose_forecast`** job in SAS Data Integration Studio.

Each row in this table corresponds to one hierarchy level of the forecast that you are creating. In other words, enter information in four rows in this table in order to create a forecast with four hierarchy levels.

Table 25.4 *Description of the BATCH_PLAN_HIERARCHY_CONFIG Table*

Column Name	Description	Data Type	Editable?	Sample Value
CONFIGURATION_TEMPLATE_NM	A unique name that identifies configuration information for each forecast. Use the same configuration template name in the following tables to enter information about a forecast: ■ CONFIG.BATCH_PLAN_KPI_CONFIG ■ CONFIG.BATCH_PLAN_INDEP_CONFIG ■ CONFIG.BATCH_PLAN_EVENT_CONFIG ■ CONFIG.BATCH_PLAN_ATTRIBUTE_CONFIG An administrator can create multiple forecasts by using one configuration template name.	Char (32)	Yes	Demand_2018Q1
FAW_DIM_DISPLAY_NM	Display name of the dimension. You can enter the name that is specified in the DIM_DISPLAY_NM column in the CONFIG.DIM_TABLE_LIST table or the name for this dimension that is currently displayed in the user interface of SAS Forecast Analyst Workbench.	Char (40)	Yes	PRODUCT

Column Name	Description	Data Type	Editable?	Sample Value
FAW_HIER_LVL_DISPLAY_NM	Display name of a hierarchy level in the dimension. You can enter the name that is specified in the DISPLAY_NM column in the CONFIG.DIM_VAR_DISP_LIST table or the name for this hierarchy level that is currently displayed in the user interface of SAS Forecast Analyst Workbench.	Char (40)	Yes	Category
FAW_PLAN_ORDER	Enter the number that represents the order of the hierarchy in which the forecast is to be created. The order values must start at `1` and must be increased by one. For example, the hierarchy level with order 1 is the highest level of the forecast. If more than one level is selected in a dimension, a higher level cannot have an order number that is greater than a lower level. The order number must be unique for each row.	Number	Yes	1
FAW_FORECAST_LVL_IND	Enter `1` to set a level to be the forecast-leaf-level. Enter `0` for the remainder of the levels.	Number	Yes	1
FAW_RECONCILE_LVL	Enter `1` to set a level to be the reconciliation level. Enter `0` for the remainder of the levels. The order of the reconciliation level cannot be lower than the forecast-leaf-level.	Number	Yes	1
INPUT_DATA_IND	Enter `1` for the hierarchy level for which you are providing hierarchical values in the input member table. Information about dimension members is provided in the input member table for this hierarchy level for each dimension that you select for the forecast. You specify the input member table name when you set the properties for the parameters of the `/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave12 (Create and Diagnose Forecast from Back-End)/faw_1202_create_and_diagnose_forecast` job. For each dimension, enter `1` for only one hierarchy level. Do not enter `1` for the leaf-level nodes in any dimension.	Number	Yes	1

BATCH_PLAN_INDEP_CONFIG

The BATCH_PLAN_INDEP_CONFIG table is an optional table that contains information related to independent variables. Enter information in this table only when you want to include independent variables in the forecast. Each row in this table corresponds to one independent variable.

You must enter information in each column based on your business requirements. The information that you enter for each column is used to create a forecast when you run the **`/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave12 (Create and Diagnose Forecast from Back-End)/faw_1202_create_and_diagnose_forecast`** job in SAS Data Integration Studio.

Table 25.5 *Description of the BATCH_PLAN_INDEP_CONFIG Table*

Column Name	Description	Data Type	Editable?	Sample Value
CONFIGURATION_TEMPLATE_NM	A unique name that identifies configuration information for each forecast. Use the same configuration template name in the following tables to enter information about a forecast: ■ BATCH_PLAN_HIERARCHY_CONFIG ■ BATCH_PLAN_KPI_CONFIG ■ CONFIG.BATCH_PLAN_EVENT_CONFIG ■ CONFIG.BATCH_PLAN_ATTRIBUTE_CONFIG An administrator can create multiple forecasts by using one configuration template name.	Char (32)	Yes	Demand_2018Q1
FAW_INDEP_VAR_DISPLAY_NM	Display name of the independent variable. You can enter the name that is specified in the INDEP_VAR_DISPLAY_NM column in the CONFIG.INDEP_VAR_TABLE table or the name for this independent variable that is currently displayed in the user interface of SAS Forecast Analyst Workbench.	Char (40)	Yes	Weather
DESCRIPTION	A description for the adjustment variable. This column is optional.	Char (255)	Yes	The climatic conditions.

Column Name	Description	Data Type	Editable?	Sample Value
FAW_INDEP_AGGRE_METHOD	The available aggregation method for the independent variable. You can enter the name of the aggregation method that is specified in the METHOD_NM column in the CONFIG.INDEP_AGGRE_METHOD table or the name for this aggregation method that is currently displayed in the user interface of SAS Forecast Analyst Workbench.	Char (32)	Yes	Average
FAW_PRE_OPERATION	The pre-operation method for the adjustment variable. You can enter one of the following values: **`none`**, **`Add`**, **`Subtract`**, **`Multiply`**, **`Divide`**, **`Min`**, or **`Max`**.	Number	Yes	Add
FAW_POST_OPERATION	The post-operation method for the adjustment variable. You can enter one of the following values: **`none`**, **`Add`**, **`Subtract`**, **`Multiply`**, **`Divide`**, **`Min`**, or **`Max`**.	Number	Yes	Multiply
FAW_INDEP_ORDER	The order number for the adjustment variable.	Number	Yes	1
ADJUSTMENT_FLG	Enter `1` in order to use the variable as an adjustment variable. Enter `0` in order to use the variable as an independent variable.	Number	Yes	1

BATCH_PLAN_KPI_CONFIG

The BATCH_PLAN_KPI_CONFIG table contains information related to key performance indicators. You must enter information in this table for each configuration template.

Enter information in each column based on your business requirements. The information that you enter for each column is used to create a forecast when you run the **`/Products/SAS Forecast Analyst Workbench/5.3 Jobs/Wave12 (Create and Diagnose Forecast from Back-End)/faw_1202_create_and_diagnose_forecast`** job in SAS Data Integration Studio.

Table 25.6 *Description of the BATCH_PLAN_KPI_CONFIG Table*

Column Name	Description	Data Type	Editable?	Sample Value
CONFIGURATION_TEMPLATE_NM	A unique name that identifies configuration information for each forecast. Use the same configuration template name in the following tables to enter information about a forecast: ■ BATCH_PLAN_HIERARCHY_CONFIG ■ CONFIG.BATCH_PLAN_INDEP_CONFIG ■ CONFIG.BATCH_PLAN_EVENT_CONFIG ■ CONFIG.BATCH_PLAN_ATTRIBUTE_CONFIG An administrator can create multiple forecasts by using one configuration template name.	Char (32)	Yes	Demand_2018Q1
FAW_KPI_NM	Display name of the key performance indicator. You can enter the name that is specified in the KPI_NM column in the CONFIG.KPI_CONFIG table or the name for this key performance indicator that is currently displayed in the user interface of SAS Forecast Analyst Workbench.	Char (40)	Yes	Demand
PERIODICITY	Display name of the forecasting interval. You can enter the name that is specified in the FORECAST_INTERVAL_DESC column in the CONFIG.FORECAST_INTERVAL table or the name for this forecasting interval that is currently displayed in the user interface of SAS Forecast Analyst Workbench.	Char (32)	Yes	WEEK
USE_STATISTICAL_FCST_PERIODS	The least number of periods that the forecasting process must consider in order to use statistical forecast results.	Number	Yes	2
FORECAST_PAST_PERIODS	The number of periods of historical data that the forecasting process must include for generating forecast results.	Number	Yes	7
FORECAST_HORIZON	The number of periods for which you want to generate forecast results.	Number	Yes	5

Recommended Reading

- *SAS Forecast Analyst Workbench 5.3: Data Reference Guide*
- *SAS 9.4 Intelligence Platform: System Administration Guide, Fourth Edition*
- *SAS Data Integration Studio 4.901: User's Guide*
- *SAS 9.4 Management Console: Guide to Users and Permissions*
- *Scheduling in SAS 9.4, Second Edition*
- *SAS Forecast Server 14.1: Administrator's Guide*
- *SAS Financial Management 5.5: Performance Guide*
- *SAS Forecast Studio 14.1: User's Guide*

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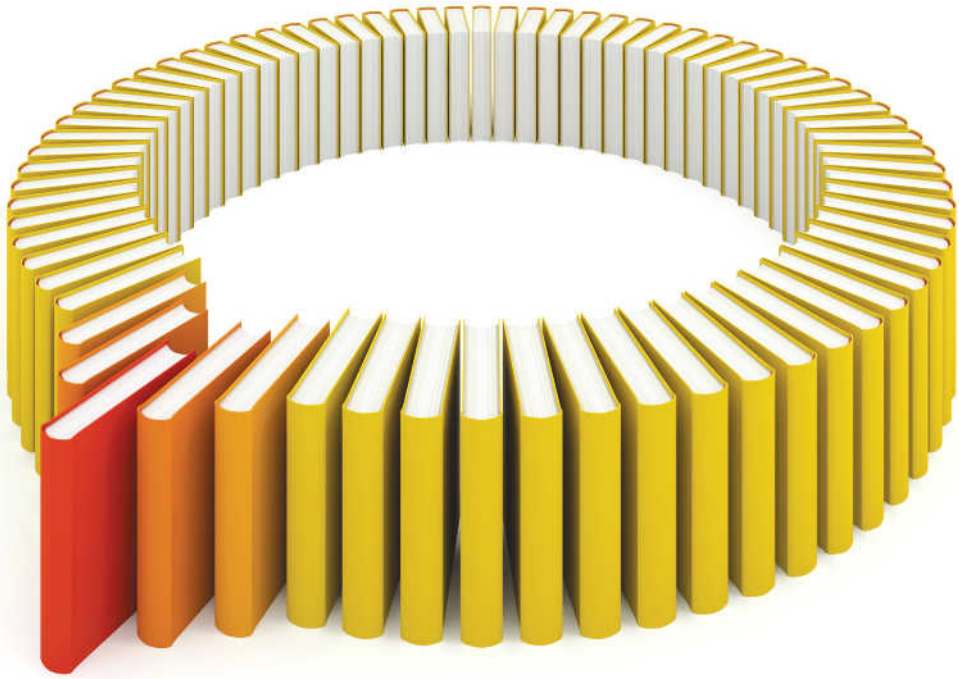

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